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COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

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NCC '78: Well Worth the Wait

CW Photo by A. Dooley

While there was often little elbow room for those waiting to visit the exhibits at NCC '78 . . .

By E. Drake Lundell Jr.
CW Staff

ANAHEIM, Calif. — Lines and then more lines marked the largest computer conference ever held as more than 51,000 showed up for the National Computer Conference here last week

Lines for registration sometimes stretched more than a mile long as some conference-goers waited more than three hours to get into the massive exhibit, which featured 353 companies in 1,041 booths.

With more than $100 million worth of equipment shown on the convention floor — ranging from the nitty-gritty of the components and OEM business to two large mainframes, an Itel Corp. AS/5 and an IBM 3031 — there was something to satisfy every technological palate.

For large users, the big news was the advent of add-on memory for the IBM 30 series as well as a plethora of terminal equipment spread throughout the four halls used to house the exhibition and technical sessions. For those interested in distributed processing, minicomputers on the exhibit floor presented the full gamut of alternatives.

News of NCC's growing popularity, however, was clouded by rumors that 100 exhibitors planned to skip next year's show at the New York City Coliseum to protest that site's limited floor space and high rental costs. Robert Rector, the executive director of the American Federation of Information Processing Societies (Afips), the NCC sponsor, and other federation officials conceded they had heard the reports, but said they had not verified their accuracy.

In addition to the registration lines, there were lines for almost everything else — for lunch, for viewing the popular exhibits, for registering at the hotels. The only other major glitch was the heat in the parking lot that was converted to an exhibit hall. With the crowd and hot equipment, temperatures reached 100° in that hall at times.

Aside from those problems, the entire event was well run and operated smoothly. The technical sessions were, for the most part, of extremely high quality, mixing blue sky computer architecture with real world problems.

The companion Personal Computing Festival drew a mob scene to the Disneyland Hotel and while panelists predicted a shift away from hobby computing to more applications-oriented uses, it was hard to tell from the exhibit floor that such a shift is under way.

In Show's Large System Action

Add-Ons Boost IBM 30 Memory

By E. Drake Lundell Jr.
And Howard A. Karten
CW Staff

ANAHEIM, Calif. — The IBM plug-compatible memory makers led a parade of firms offering new products for large system users at the National Computer Conference here last week, leaving behind a trail of lowered prices.

In addition to the memories, product debuts of interest to large users included a distributed data entry system, a computer output microfilm (COM) unit, plotters and measurement equipment.

With IBM showing a 3031 system — and rumors abounding about its inability to deliver the amount of memory needed by users — Electronic Memories and Magnetics Corp. (EMM), National Semiconductor Corp. and Memorex Corp. all were touting their replacement memories for the IBM 30 series. Several other firms — Itel Corp. and Storage Technology Corp. in particular — said they will soon be announcing systems for the 30 series family, and Intel Corp. showed its previously announced memory for the 30 series.

The heavy action in this area is apparently prompted by IBM's inability to deliver memory in the quantity desired by users, according to most of the

(Continued on Page 8)

Congress Wants DP Policy, Not Regulation: Hollings

By Edith Holmes
CW Staff

ANAHEIM, Calif. — Congress has no desire to add to the regulatory burdens the DP industry already carries, Sen. Ernest F. Hollings (D-S.C.) said at the 1978 National Computer Conference here last week.

"All the nation's problems can't be solved in Washington; in fact, they are usually better solved elsewhere. I don't know of a better example of this than the computer industry seated here before me," the senator stated.

But the country's legislature does feel the need to develop national policies regarding information and the computer and communications technologies that support its collection, manipulation and dissemination, Hollings said. In the absence of policies, "technology, which should provide only the force for change, also dictates the direction change takes," he explained.

The more Congress employs computer technology on Capitol Hill, the more its members become aware of the policy issues pervading the use of DP. At present, the government's information policy development is spread among several agencies.

"There is no information policy, and

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CW Photo by E D Lundell Jr

. . . The exhibit floor sometimes looked like it offered room to roam.

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Communications Act Rewrite Asks Industry Deregulation, New FCC

By Edith Holmes
CW Washington Bureau

WASHINGTON, D.C. – Deregulation of the communications industry, a new and smaller version of the Federal Communications Commission (FCC) and streamlined procedures for handling common carrier services are the main points of legislation drafted by the House Communications Subcommittee and released here last week.

A complete rewrite of the Communications Act of 1934, the draft bill would abolish the FCC and create the Communications Regulatory Commission (CRC). That commission would be mandated to rely on market forces and competition to provide fair rates and a variety of communications services, according to sources close to the House subcommittee.

The CRC would consist of five commissioners rather than the present seven on the FCC and would only exert its regulatory authority where marketplace forces are deficient and monopoly services exist, the sources said.

The third of the draft act's eight sections deals with common carrier telecommunications – domestic and foreign. One provision would bar a manufacturer of telecommunications equipment from providing communications services, effectively requiring the divestiture of Western Electric Co. from AT&T.

Specifically, the draft law reads, "No person shall provide a noncompetitive telecommunications service and also be engaged in the manufacture of equipment used in furnishing any common carrier service." This provision would take effect three years following the enactment of the law by Congress, sources stated.

The proposed Communications Act of 1978 would also make it illegal for any common carrier to deny specialized carriers the use of its facilities. AT&T would have to permit specialized carriers access to its local loops and could only be exempted from providing such a connection if it could prove that the technical and economic harm to the Bell network would exceed the benefits of the specialized service to the public, the Capitol Hill sources said.

On the other hand, specialized carriers would have to pay an access charge when providing their intercity services through AT&T's local switching facilities. Because these specialized services may deprive Ma Bell of some revenue and force telephone rates up, the draft legislation calls for the CRC to establish a "Universal Service Compensation Fund" to help maintain telephone rates at levels the public can afford.

The proposed law suggests that specialized carriers should bear the burden of forcing an increase in the costs and rates of the monopolized, public-switched network, the sources noted.

Another provision favorable to AT&T would require the CRC to evaluate depreciation schedules every five years with the goal of making this cost to the monopolist less burdensome. The House Communications Subcommittee believes Ma Bell can do a great deal with her network if she can write off much of the cost of depreciation on her huge facilities, the sources suggested.

AT&T should have the monetary ability to keep up with the kinds of services being offered by the smaller, more specialized carriers who don't have the depreciation of a plant built up over decades, the sources said.

The act would allow common carriers to hold or acquire shares in companies providing nontelecommunications services. Common carriers could also offer nontelecommunications services through subsidiaries, according to the draft law.

Defining 'Common Carrier'

The CRC would be charged with deciding what constitutes a common carrier. The carrier, however, could construct, extend or operate a new line so long as it informed the new regulatory agency of its intentions. Unlike the FCC, the CRC could not veto a carrier's expansion plans, the congressional sources stated.

The seventh section of the draft law would rename the National Telecommunications and Information Administration (NTIA) in the Commerce Department the National Telecommunications Agency.

Like President Carter's Reorganization Plan No. 1 of 1977, the Communications Act of 1978 would make the Commerce agency "the principal adviser to the President in matters relating to telecommunications issues and policy," the congressional source said.

In announcing the draft rewrite of the Communications Act last week, House Communications Subcommittee Chairman Lionel Van Deerlin (D-Calif.) said his counterpart in the Senate, Sen. Ernest F. Hollings (D-S.C.), has agreed to the bill's provisions.

The House committee expects to begin hearings on the rewritten Communications Act in late June or early July. Revisions will be made to the draft and the congressman hopes to introduce it in the House in January.

Anticipating opposition from the Bell System, Van Deerlin hopes the Congress will pass a new communications law by late 1979 or early 1980.

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SOFTWARE INDUSTRY ASSOCIATION

Peripherals Dominate NCC's Mini Highlights

By Jeffry Beeler
CW Staff

ANAHEIM, Calif. — Only nearby Disneyland offered area visitors a larger and more varied assortment of attractions than last week's National Computer Conference, and minicomputer equipment vendors did their share to keep the Anaheim Convention Center bursting at the seams with attendees.

Among the scores of minicomputer companies jammed into the NCC exhibit areas, users and prospective users found examples of nearly every DP equipment type, including many products that had never before been publicly displayed.

As with some of the smaller product shows that immediately preceded the conference, the minicomputer sector of this year's NCC floor was dominated by peripherals introductions, although freshly announced CPUs and memories were also much in evidence.

In the processor area, Computer Automation, Inc. used the conference as an occasion to announce its first foray into the end-user market with the introduction of its Protos computer system. Described as a high-end addition to the company's product line, Protos incorporates a CA 4090 processor modified to compete in the same performance class as the Digital Equipment Corp. PDP-11/70, Data General Corp. M/600 and Prime Computer, Inc. Model 500, according to CA.

Protos reportedly holds a minimum of 128K bytes expandable to 2M bytes and provides a feature called Automap, which permits users to access files in memory without forcing them to perform I/O operations. It also provides a Protos multiprogramming operating system with a systems implementation language dubbed Alamo, company officials said.

A minimum configuration with one 80M-byte disk drive unit, a CRT terminal, a 300 line/min printer, eight asynchronous I/O ports and dual 256K-byte floppy disk drive units costs $80,000, a spokesman added.

Multiprocessor System

Also introduced at the conference was a modular multiprocessor system from Basic Timesharing, Inc. (BTI). The Model 8000 embodies a "variable resource architecture" with a 32-bit master bus that transmits 60M byte/-sec to as many as 16 hardware modules, BTI officials said.

The bus structure also reportedly allows the system to accommodate up to eight supermini-like processors.

Software features available with the system include Pascal plus Ansi-standard Cobol, Fortran IV, the Codasyl data base management system, extended Basic, RPG-II and assembler, company officials said.

A minimum 8000 configuration with one 256K-byte CPU, 33M-byte disk unit, four I/O channels and one asynchronous terminal port costs $86,850.

Designed to accept multiple on-line terminals, the system also comes with a virtual multiprocessing monitor.

Another vendor to introduce a miniprocessor at the show was Ampex Corp., which announced a 15-in.-square single-board computer compatible with DG's Nova series. The Model 12 reportedly represents the first in a series of Ampex minis that can accommodate Nova peripherals and applications packages.

The second computer in that series is slated for introduction in late summer, Ampex officials said.

Expandable to 64K bytes, the Model 12 cycles in 1,200 nsec and is said to come in several versions. One of these versions occupies 5.25 in. of rack space and five CPU chassis slots, the product's developers said.

Another requires 10.5 in. of rack space and 13 board slots, while the largest version occupies 22.75 in. of rack and 17 chassis slots, they added.

A 32K-byte system requiring five board slots costs $3,975 in OEM quantities, Ampex officials said.

Peripherals Debut

In the peripherals area, Control Data Corp. announced its Certainty series, a line of IBM Series/1-compatible mass storage and I/O units. The introductions include three members of the 270 series of removable disk systems with 63M-, 126M- and 240M-byte storage capacities; four members of the 230/-240 series of fixed disk systems designed to hold 9.3M bytes and 19.7M bytes; a 592K-byte 210 series floppy disk system said to transfer 31,250 byte/sec and access in 23 msec track-to-track; and two 450 series band printers said to output 220- to 360 line/min and 440- to 720 line/min.

Also introduced were a Series 420 matrix printer described as outputting 70 line/min with a 132-char. line and a 610 series CRT terminal that displays 1,920 char. and operates up to 4,000 feet from its host processor.

Purchase prices for the 270 series range from $21,250 to $41,500; for the 230/240 series, from $6,850 to $14,990; and for the 450, from $10,995 to $15,300, CDC said. The 210 series, meanwhile, costs $2,690, compared with $4,030 for the 420 series and $2,420 for the 610 series, the company added.

Among the show's other peripherals manufacturers, Shugart Associates announced it was charting a new corporate direction with the introduction of its first rigid disk systems — the SA4000 series, which comes in 14.5M- and 29M-byte versions with an optional 144K bytes of head-per-track storage.

Compatible with the IBM System/32, System/34 and Series/1, the fixed-disk systems reportedly access in 87 msec, rotate at 2,964 rpm and transfer 889K byte/sec. The single-disk SA4004 provides 808 addressable tracks, while the dual-disk SA4008 has 1,616 addressable tracks, Shugart noted.

The 14.5M-byte unit costs $2,550 in end-user quantities and $1,325 in quantities of 250 or more, compared with the 29M-byte version, which sells for $3,500 in end-user quantities and $1,800 in OEM quantities.

Show's Only Software Surprise

Cobol Switched Between Environments

By Don Leavitt
CW Staff

ANAHEIM, Calif. — A Cobol system was moved from one hardware environment to another with the switch of a pair of floppy disks in one of the most dramatic software demonstrations linked to this year's National Computer Conference.

Unfortunately, most NCC attendees never saw this particular demonstration. The UK's CAP-CPP group of software companies showed its Microcobol capabilities in a third-floor suite in the Disneyland Hotel, a quarter of a mile from the overcrowded Convention Center.

The software — an interpreter and runtime system — was switched back and forth between a Digital Equipment Corp. LSI-11 and Mostek Z80-based small business system. The floppies could have been transferred to any other microcomputer with equally effective results, spokesmen claimed.

In order to emphasize how simple the switch from one of the micros to the other really is, the vendor let a couple of its nontechnicians handle the chore of swapping the floppies and running the programs.

An American affiliate of the British firms is currently offering Microcobol to any interested system vendor, a spokesman noted.

Nothing Else New

Other than Microcobol and its transportability, this year's NCC had very little new to attract those interested in software. There were useful packages being discussed, but apparently no new offerings this time around.

The vendors of data base management systems probably made up the biggest single group. Cullinane Corp. had a booth where it described the latest version of its Integrated Data Base Management System (IDMS) and its related supporting packages.

MRI Systems Corp. was there, as well, with descriptions and demonstrations of its data base system, System 2000, and the Control 2000 data dictionary. Almost next door was the booth sponsored by Software AG of North America, where Adabas was the topic of dicussion.

Software AG also had a neatly handled radio-controlled robot which attracted the curious, even though there were at least two other "automata" roaming the exhibit floor.

Management Science America had a booth to show off its application software, as did McCormack and Dodge. A newcomer to the main NCC exhibition, but a carryover from last year's Personal Computing Fair, was Billings Computer Systems of Provo, Utah, which is offering a micro-based hardware system and a range of accounting application packages.

Issco was on hand, too, talking about its Disspla graphics software and the Tellagraf facility that allows an intermixing of graphics and tabular data to make management reports more meaningful.

MSP, Inc. was at the big show, but almost lost in the look-alike booths financed by the British government for about a dozen firms that are based or had their roots in the UK.

Unlike many of the earlier NCCs or even earlier Joint Computer Conferences, NCC '78 attracted very few remote computer service vendors. Control Data Corp. had a hardware booth, as usual, but there wasn't even a reference to its Cybernet service anywhere to be seen.

Tymshare was touting its Tymnet packet-switched communications and General Electric people were talking about terminals and not their timesharing service.

Altogether, a quiet show — in terms of software — except for the Microcobol demonstration.

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Wants '76 Law Amended

Contu to Recommend Copyrights for Programs

By Edith Holmes
CW Staff

AHAHEIM, Calif. — The National Commission on New Technological Uses of Copyrighted Works (Contu) will recommend that Congress extend the protection of the 1976 Copyright Law to cover computer programs when it issues its report to Capitol Hill on July 31.

If Congress agrees with this recommendation, the moratorium on employing the full weight of the copyright law to guard against unauthorized copying of software will be lifted, Michael S. Keplinger, lead attorney on the Contu staff, told a 1978 National Computer Conference session on the legal aspects of software protection here last week.

Contu will suggest that the copyright law be amended to include a definition of a computer program, calling it "a set of statements or instructions to be used directly or indirectly in a computer to bring about a result," Keplinger said.

The proposed amendment of the law also includes a new section that would make unquestionable an owner's right to "copy" his program for use in a computer system, the Contu lawyer added. Copies of the software can be leased, sold or transferred with the authorization of the owner of the program and, hence, the copyright.

These suggested changes to the copyright law represented the majority opinion of the commission of 12 men and women on what legal protections should be afforded software, Keplinger noted. A minority stance, taken and led by prize-winning author and Contu commissioner John Hersey, contended that programs are a part of a machine and that extending copyright protection to them would harm the status of works traditionally guarded by copyright, ultimately doing severe cultural damage.

Hersey recommended that a new protective category — something like copyrights and patents — be devised specifically for software and other products of an electronic age. Though much debated, that concept was rejected by Contu.

Debate Goes On

Independent of Contu's actions, the debate on what legal protections best fit software continues in the computer industry and was evident at the NCC session as Martin R. Goetz of Applied Data Research, Inc. agreed with Hersey that computer programs are "machine components" and Robert O. Nimtz of Bell Laboratories maintained that nothing less than the trade secret laws will provide adequate safeguards for software that has a commercial value.

While he echoed Hersey in the belief that software is part of the computer system machine in the same way as a disk or a tape, Goetz ventured further, saying the same laws — federal and state — that apply to machines and their components should apply to software.

Software should be eligible for protection by copyright and patent; software should be eligible for investment tax credits, Goetz said. But software should also be subject to sales and personal property taxes and should be able to be capitalized, he added.

There is no logical argument for exempting software and software systems from taxation, Goetz stated. There is overwhelming evidence that computer programs are tangible items and should be treated exactly as hardware is under state and federal laws — "no better and no worse," he said.

"It's time we stopped twisting the legal definition of software to meet our own economic desires," Goetz declared.

The National Bureau of Standards (NBS) believes copyright protection is applicable to computer programs and simple clarifications in the law will suffice, he said. NBS would copyright only the source code and then call conversion of source code to object code making a copy of the software because no logic is added in the process.

The translation of a program to another language should be regarded as a derivative work that is also entitled to legal safeguards, in NBS' view, Goetz said.

'Bought and Sold'

"I don't care how any of us defines software," Nimtz stated. "It is a commercial product that exists and is bought and sold in the commercial marketplace. Software has costs and profits associated with it."

The commercial value of computer programs can only be protected, "now or ever," by trade secret laws, Nimtz said. "The copyright law doesn't stop anyone from taking a program; that law just provides a remedy once the software has been copied," he added.

Nimtz is convinced software firms and others creating programs will continue to license their wares for use under contracts with trade secret clauses,

Nimtz believes the copyright law will have no impact on the computer industry if applied to software — except for a notice of preemption in the law which could keep programs protected by copyrights from being safeguarded by trade secrets at the same time.

"ALL TP MONITORS
ARE NOT ALIKE"

To the first time user most teleprocessing monitors must appear alike: "Multi-threaded, 3270 Mapping, Recovery, ease-of-use". That's what they all say. The new user often can't ask the specific technical questions necessary to choose between the alternatives. But, they learn the hard way after they select a product that won't do the job, consumes excessive computer resources, or provides poor performance.

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Some for Distributed DP

Vendors Exhibit Bevy of Intelligent Terminals

By Ronald A. Frank
And Marguerite Zientara
CW Staff

ANAHEIM, Calif. — Intelligent terminals and terminal systems proliferated among the data communications products displayed at the National Computer Conference here last week.

An intelligent terminal with IBM 3270 compatibility was introduced by Teletype Corp. The Model 4540 interactive I/O terminal includes dual microprocessors and was designed for such applications as inquiry/response, data entry and data retrieval.

The 4540 operates with binary synchronous communications protocol using either Ascii or Ebcdic code and has transmission speeds ranging from 2,400- to 9,600 bit/sec, the company said.

The intelligent terminal is described as the first of a series and includes error checking and correcting. The microprocessor-based controller incorporates up to 64K of addressable memory, up to 32 ports for device connection and two RS-232 ports to interface with transmission facilities.

A typical system of six CRTs in a clustered configuration costs about $17,000, with first deliveries scheduled for the first half of 1979.

Racal-Milgo, Inc. introduced the System 4000 intelligent terminal system, which is available with built-in emulators for the IBM 3270 and 2260, Univac UTS 400 and Honeywell Information Systems, Inc. 7700 terminal modes. The system includes a cluster/controller, up to 1M byte of floppy disk storage and CRT terminals.

Program and task scheduling and dynamic memory management in the controller are supervised by the Virtual Machine Operating System.

A typical configuration with four CRTs and a line printer costs about $20,000 with initial deliveries scheduled for this September.

Incoterm Corp. showed the 1001 CRT with detachable keyboard which is said to be compatible with earlier Incoterm display devices. The unit costs $1,665.

The company also introduced its 3000 line of intelligent source data collection terminals. Model 3102 and 3106 are data entry stations with alphanumeric keypad. The 3102 costs $1,650 while the 3106 is priced at $1,750.

The 3305 labor-reporting terminal includes an 18-character display with keyboard in a wall-mounted unit. A typically configured terminal costs $3,595, Incoterm said.

Computer Devices, Inc., showed its Miniterm PRO Model 1206, a portable terminal with 32K of main memory and built-in tape drive. The 1,200 bit/sec unit is said to operate in typewriter, teletypewriter or numeric cluster configurations and costs $5,495. Rental on a three-year lease is $225/mo, the company said.

General Automation, Inc. introduced its Network Data Series (NDS) for distributed DP applications using the firm's Autonet network architecture, which is said to employ packet-switching techniques.

Each NDS host processor can handle four CRTs, a 10M-byte disk and a 200 line/min printer. First deliveries are set for this fall.

Digital Equipment Corp. unveiled the PDT microcomputer-based programmable data terminals. All three PDT-11 terminals use the DEC VT100 display.

The PDT terminals are said to be compatible with the instruction set of PDP-11 processors. The PDT-11/110 costs $3,900.

Honeywell Information Systems, Inc. showed its VIP 7801 CRT, a microprocessor-based display. The 7801 costs $2,885 and is said to have extensive data edit and validation capabilities.

Rash of TI Offerings

Texas Instruments, Inc. announced a plethora of products here, including the DS 990/AMPL multistation prototyping lab in three versions for TI's 9900 family of microprocessor applications. Each of the systems can reportedly support four lab stations.

The systems are based on the DS 990 models 4, 6 and 8 systems with their 990/10 minicomputers, according to the firm. These systems include a 128K-byte memory, disk storage from 10M to 100M bytes, DX10 disk-based software and Model 911 CRT terminals.

A configuration including the DS 990 Model 4, Model 810 printer, TMS 9900 emulator and software, Trace and programmable read-only memory programming is priced at $36,745, a company spokesman said.

TI also introduced five members of the Series 700 intelligent terminal family. The models 771/1 and 2 and the 774/2, 3 and 4 were designed for distributed processing environments, the firm said, and each model offers upward compatibility with the models 770 and 774/1.

The Model 771/1 is a single-station intelligent terminal with a 1,920-char. CRT display, two diskette drives, data entry keyboard and 64K-byte processor. A built-in Silent 700 terminal printer is included with the Model 771/2, the firm said. The Model 771/1 is tagged at $7,450, the Model 771/2 at $8550.

The Model 774/2 is a multistation intelligent terminal system with dual diskette storage. Standard hardware reportedly includes a 96K-byte processor, 1,920-char. Model 911 CRT, dual 256K-byte diskettes and two communications ports. The price of the unit is $15,450.

The Model 774/3 standard configuration adds a 5M-byte fixed platter and 5M-byte removable cartridge disk drive to the 774/2. Its price is $23,200. The Model 774/4 substitutes a 160K-byte processor and an expansion cabinet to support as many as eight CRT stations and five printers. Memory can be expanded to 416K bytes, TI said. The unit costs $35,725.

Also introduced was the Omni family Model 820 KSR terminal, which reportedly features 150 char./sec printing of an original and five copies with a 9 by 7 dot matrix format, 128-char. alphanumeric Ascii keyboard and answerback memory. Transmission rates are from 110- to 9,600 bit/sec. The unit costs $2,395.

Tektronix Products

Tektronix, Inc. previewed several new products, including a color graphics terminal, 25-in. CRT terminal, C-size programmable plotter and a library of graphic software. The 4027 color graphics terminal has a raster scan display with capabilities of scrolling graphics and alphanumerics and multipage graphing with the added feature of color, according to the firm. The unit will be available later this year for $8,695.

The Model 4016-1 computer CRT terminal was also shown. It has a 25-in. diagonal screen and 4,096 by 3,120 "viewable high resolution," according to the company. It is suited for displaying the graphics found in contour mapping, seismic analysis and energy field modeling. Available later this year, it will cost $19,500.

Tektronix's Model 4663 interactive digital plotter has a built-in processor and can plot on up to 17-in. by 22-in. paper or Mylar with felt tip, ball point or wet ink pens. Available in the fall, the unit is priced at $9,495.

The Plot 10 interactive graphics library supports color graphics terminal applications with color paneling of irregular polygons and support for color output to the Tektronix 4662/4662 interactive digital plotter, the firm said. It is divided into five logical levels and is priced beginning at $2,500.

Congress Wants Policy, Not Regulation

(Continued from Page 1)

we must have one," Hollings maintained. "The government must come to grips with information, computers and communications."

Hollings highlighted four issues that have captured congressional imaginations and may see some action in that third of the federal government soon. The relationship between computers and communications and how much of the DP business the Federal Communications Commission (FCC) should be permitted to regulate headed the senator's list of concerns.

Hollings added to this concern congressional interest in the federal government's own computer operations — specifically, how better software standards might make computer procurements more sound; in the export of U.S. electronic goods to such hardy world competitors as Japan and West Germany; and in individuals' rights to the privacy of their records and limited government access to personal information.

The FCC is nearing the completion of its second Computer Inquiry, designed to further define the line between what the agency can and cannot regulate, Hollings reported. Although scheduled for some decision this week, resolution of the Computer Inquiry has been postponed until mid-July. Congress is very interested in what the FCC will have to say, the senator told the NCC audience.

The House Communications Subcommittee last week announced the initial results of its efforts to rewrite the Communications Act of 1934 to take into account changes in communications technology in the last 40 years (see story on Page 2). The rewrite involves many of the same questions with which the FCC is wrestling, Hollings said.

CW Photo by A. Dooley

Sen. Ernest F. Hollings

"Neither Congress nor the FCC should regulate the DP industry," the senator stated. "It is an industry that has grown and prospered through competition in the free market."

Hollings termed encouraging the National Bureau of Standards' (NBS) request for substantial funding increases for the software standards work planned by its Institute for Computer Sciences and Technology. He and others on and off Capitol Hill believe standards to be the key to better acquisitions of computer and communications equipment by federal agencies.

While the U.S. wants neither protectionism nor trade wars, Hollings stressed that the government must do something to stop growing trade imbalances between the U.S. and such countries as Japan and West Germany. He asked the industry to let Congress know whether its new U.S.-Japan Trade Facilitating Committee is having any positive effects, measured by an increase in U.S. electronics exports to Japan.

Congress will also pay increasing attention to trade barriers in the form of restrictions on the flow of information across national borders, Hollings maintained.

No Omnibus Bill

Finally, Hollings discussed privacy, telling his audience that there are presently more than 100 privacy-related bills before Congress. He said the Senate is reluctant to go the route of omnibus privacy legislation, fearing overregulation and preferring, instead, to pass laws that govern specific areas, such as financial and medical records.

Hollings stated that while Congress hopes to head off some of technology's negative social impacts through the development of national policies, it wants to foster continued competition in the computer industry by not regulating it. "The policies will become obsolete almost as quickly as the technology does," the senator suggested, adding "the industry has done a good job of regulating itself."

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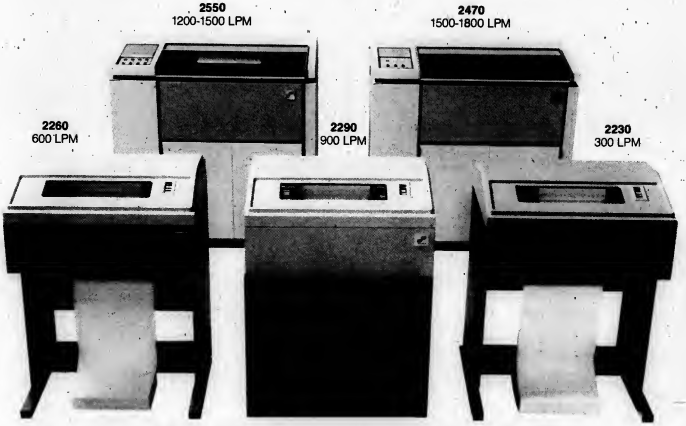

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Not the Only Show in Town

By Don Leavitt
CW Staff

ANAHEIM, Calif. — The National Computer Conference was expected to draw 40,000 people, but at least one person — with a substantial DP background — wasn't even aware of the conference the night before it opened.

He was here for a conference all right, but it had nothing to do with DP. It was a training session for real estate salesmen.

An amiable soul, his story came out over a quick supper. Seems he was a systems analyst at the University of Wisconsin until about seven years ago, when he decided enough was enough. He had a good job with good pay, but he was also at the university when terrorists bombed the data center.

He decided he wanted something out of life with a good deal more human contact. So he got into real estate. He sells new houses, but he also buys, remodels and sells old ones, too.

Recently he and his partner bought a franchise under the Century 21 real estate plan when it became available in Wisconsin. It helps with training, supplies and management planning. He sounded both satisfied and appreciative of all the help it had provided, leaving him free to work with clients.

So what's that got to do with Anaheim? Easy: Century 21's national headquarters is here and Mr. X — we never did catch his name — had come for that company's national conference.

Although he was politely interested in NCC, he doubted he'd even look in; the vocabulary he could remember from a few short years ago "just didn't seem to fit what I've heard of computers today."

CW Photo by A. Dooley

This year's NCC was held in the Anaheim Oranges tennis team's home town; next year's conference will come to fruition in the Big Apple.

Three Independents Boost IBM 30 Memory

(Continued from Page 1)

vendors here. They indicated users are receiving only minimum memory with their 30 series processors and reported extremely high demand for storage with the systems.

The price cuts offered by the plug-compatible memory makers were startling — ranging up to 50% off IBM's standard $110,000-per-1M-byte price.

The biggest problem facing the manufacturers, they said here, is finding user sites for beta tests of the machines since there are so few 30 series systems in the field.

Three From EMM

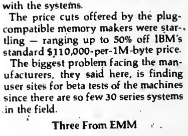
EMM offered 30 series users three memory models: the 7/3031, 7/3032 and the 7/3033, covering the range of the 30 series processors. Based on 4K static MOS chips, the units are field-installable and expandable, EMM said, adding they are available in 1M-byte increments vs. the 2M-byte steps offered by IBM for the 3032 and 3033.

Four-way interleaving is featured on the 7/3031 and 7/3032, while the 7/3033 is capable of eight-way interleaving. Fetch time for the 3031 replacement is 345 nsec, while the 7/3032 features a 320 nsec fetch time and the 7/3033 offers a fetch time of 285 nsec, the firm said.

Deferred maintenance is offered on the system as it is on other EMM replacement memories. Any troublesome 1M byte of memory can be taken off-line by a switch on the front panel for later maintenance.

The 7/3031 can be upgraded in the field to a 7/3032 "within hours," EMM claimed. In addition, the 7/3033 has a standby memory feature which can take over in the event of double-bit errors, and the front panel permits users to switch out either IBM memory or EMM memory while diagnostics are run.

The EMM units will cost between $77,000 and $88,000 per 1M byte, depending on configuration and amount of memory.



CW Photo by A. Dooley

Sometimes it was all just too confusing, and maps helped.

'Chip Is the System'

National Semiconductor Corp., whose exhibit proclaimed that "the chip is the system," is also offering a complete line of series 30 replacement memory — the 8331 for the 3031, the 8332 for the 3032 and the 8333 for the 3033. The units provide performance similar to that of IBM memory, but are based on 16K random-access chips rather than the 4K MOS chips used by IBM — and National Semi is offering some models for half the price of IBM memory: $55,000 per 1M byte, a spokesman said here.

National Semi is also featuring regulated switching power modules in the units which permit them to run for 50 msec without input power, reducing the risk of losing data with momentary power outages, the firm said.

Error diagnostics with the memory systems allow them to pinpoint individual chips so a chip instead of an entire board can be replaced when found faulty.

Deliveries will begin in the fourth quarter of this year.

10M Total From Memorex

Only two units were announced by Memorex — the 6331 for the 3031 processor and the 6332 for the 3032. For 3031 and 3032 users, Memorex offers 10M bytes of storage in 1M-byte increments, which give the system a total of 12M bytes when combined with the minimum IBM memory.

Memorex has taken the middle route in the size of its chips, using 8K MOS random-access chips. The unit is said to equal the IBM performance levels of 345 nsec for fetch and store.

A typical 2M-byte system lists for $148,000 with a monthly maintenance charge of $675. A two-year lease is available at $4,900/mo. The memories will be shipped later this year, the firm said.

Cache With CCD

Memorex also introduced an innovative 3770 disk cache system that combines disks with a 1M-byte charge-coupled device (CCD) array. The unit, which sells for $55,000 and rents for $1,650/mo on a two-year lease, fits logically between the string controller and the disk drives themselves and stores the most used data on the disk drives.

With its own software, the system determines which data is getting heaviest usage and shifts this data from the disk to the CCD memory in a staging operation. Depending on the hit rates for data in the memory, the performance improvements can be dramatic, Memorex claimed, adding that an improvement of 50% is guaranteed for users with the Memorex 3674 control unit.

On the average, for example, the seek time for a full track of 13,030 bytes from the 3770 is .1 msec for the unit compared with 10 msec on disks and the transfer time is 10.9 msec for the CCD device compared with the 16.7 msec disk time; the rotational delay is 2 msec with the CCD memory compared with 8.3 msec, the firm said.

First deliveries of the unit are slated for next February.

Test Unit Sans Sensors

On the performance side, Tesdata Systems Corp. expanded its line of measurement equipment with the MS-108 Channel Event Processor. The unit uses no sensors and can be attached to the channel interface of any IBM-compatible block multiplexer or selector channel, Tesdata said.

The Channel Interface Module (CIM) in the system essentially recognizes all data coming through the channel. This in turn can be analyzed by five microcomputers in the control unit, each with 32K of memory, a spokesman explained.

The user can program the system to determine what exact measurements he wants to make on the channel data, Tesdata said, adding each CIM can handle eight channels and up to eight CIMs can be linked together for a total of 64 channels. However, only eight channels can be measured at any one time, the spokesman noted.

The unit sells for $27,500 and is used with the firm's MS88 series of measurement systems.

Calcomp COM Unit

California Computer Products, Inc. used the occasion to introduce a 15,000 line/min COM unit. Company officials said the Model 1680 includes a number of program-selectable character sizes, as well as several differing reduction formats.

Scheduled for initial delivery in October; the unit will sell for $225,000, company officials stated.

Other offerings from the company were plotter controllers and a desktop drum plotter. The controllers, designated the models 909 and 930, are microprocessor-based units designed to drive plotters; they sell for $13,000 and $35,000, respectively.

Pertec Computer Corp. weighed in with a scaled-down version of its previously introduced XL40 distributed processing system. Company officials said the microprocessor-based system, called the XL20 and scheduled for initial delivery in October, is capable of serving up to four CRTs and four diskette drives with a maximum of 4.8M bytes of storage.

Memory for the system ranges from 80K to 128K bytes in 16K-byte increments, with a memory cycle time of 600 nsec. Terminals for the system have either 480- or 2,000-character CRT displays, with printers capable of speeds from 160 char./sec to 900 line/-min.

A configuration with 80K bytes of memory, two diskettes with 2.4M bytes each, data communications, the 480-character CRT and a 160 char./sec printer sells for $20,560, according to the company.

But Change Predicted

Federal Privacy Attitude Called 'Benign Neglect'

By Marguerite Zientara
CW Staff

ANAHEIM, Calif. — "Benign neglect is the federal government's approach to the problem of individual privacy in the face of increasing numbers of data banks," according to Robert Ellis Smith, publisher of the *"Privacy Journal"* in Washington, D.C. Speaking at a lively and well-attended National Computer Conference session on privacy and data banks, Smith predicted the Carter Administration's attitude will change in the next few years as the public becomes more aware of the issue and of its legal rights in regard to it.

The session, chaired by Oliver R. Smoot, vice-president of the Computer and Business Equipment Manufacturers Association (Cbema), opened with a discussion by Richard Neustadt, assistant director of the White House Domestic Council Policy Staff, of the government's past and present attempts to come to grips with the problem of information gathering as it affects administrative efficiency and personal privacy. He cited several disjointed studies that have been conducted in the past five years by government task forces which then disbanded and said a permanent mechanism must be institutionalized to study the problem.

The government is now starting to "develop policy" in this area, Neustadt said, and "hopefully, next year legislation will be passed addressing the issue."

Points to Ponder

Neustadt mentioned four points that the government must consider in its policymaking. The first is the necessary constraint of the government's ability to repress. "We do not want a police state and we do want individual protection," he said.

Secondly, institutions must be prevented from making decisions based on information such as sex or income. The accuracy of information must be ensured, Neustadt said, and a citizen should have "the right to be left alone."

He noted that even though the Privacy act of 1974 restricts the transfer of information among governmental agencies, the actual guidelines are very vague, necessitating a statement of limits and procedures.

The top priority task is to do some federal "housecleaning." "We are still collecting too much information on people," he said, although the rate has been reduced by 8%.

He also said the public should be leery of extending federal regulation to the private sector and also noted some privacy recommendations, if implemented, would have significant detrimental impacts on the inflationary economic situation in the U.S.

Neustadt recommended openness of information dispersal by institutions so citizens can make informed choices about the institutions they patronize. Since individuals in the U.S. have widely varying degrees of interest in the issue of privacy, a policy that reflects that fact by transferring privacy costs to individuals should be developed, he said.

Willis H. Ware, corporate research staff member of The Rand Corp., deferred for a moment his discussion of the international issues involved in the privacy question to berate the federal government for its "tardiness' in acting upon the privacy situation. He cited the country's "irreversible commitment to computer technology" and called the issue a global one, as opposed to an issue of details.

A cohesive strategy is needed for dealing with the problems raised by electronic funds transfer (EFT), electronic mail, privacy and recordkeeping and international data flow, he said. He also called for a "trigger mechanism" to cue legislators and the populace when important developments in technology are imminent.

In discussing the international privacy issue, Ware called it a "horribly confused mess — an information stew in which the ingredients don't blend." Included in that "stew" are the matters of privacy, telecommunications, trade tariffs, cultural heritages and national security, he contended.

One of the problems in international security, Ware said, is merely a semantic one. Europeans call it "data protection" while Americans call it "privacy." Another stumbling block is the pervasive sense of nationalism in Europe. A third concern is that underdeveloped countries are "beginning to notice the goodies and they want their share in the information world," Ware said.

The new and different concept to be considered now, Ware said, is what happens if information becomes commingled in one physical location, but under different legal jurisdictions.

Ware proposed that, in the case of travelers, data collected about a traveler in his resident country stay in the resident country and be subject to the privacy safeguards of that country. Data collected about the traveler in a foreign country would stay in the foreign country and would be subject to the foreign country's private safeguards.

Ware concluded by praising the com-

(Continued on Page 12)

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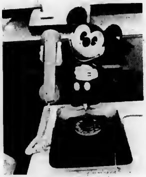

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NCC '78

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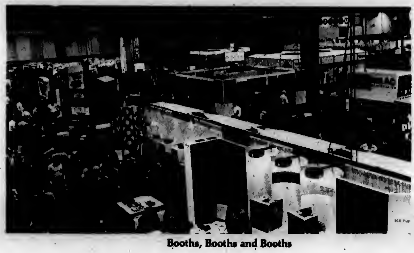

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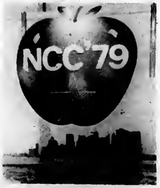

C'mon to the Big Apple
For NCC '79

Synthetic Fuel No Answer, DP Energy Analysis Finds

By Marcia Blumenthal
CW Staff

ANAHEIM, Calif. — Would synthetic fuel be an effective commercial alternative to continued dependence on costly fossil fuels by foreign nations?

This was a policy question faced by a task force appointed by former President Gerald R. Ford, according to Dr. Steven N. Tani of SRI International, and the answer was no.

The answer was arrived at through use of a computer-based method known as probalistic decision analysis, Tani explained. SRI International performed the analysis under contract to that energy task force.

Speaking at the National Computer Conference here last week, Tani indicated the project represented one of a growing number of instances in which computers have been used by government to resolve policy issues in the best interest of the nation.

As originally conceived, commercial synthetic fuel would, among other benefits, give the U.S. bargaining power against foreign oil suppliers as well as an actual oil supply. However, balanced against these benefits were the billions of dollars needed to develop the technology as well as the risk of environmental damage that could be caused by mining oil shale for synthetic fuel manufacture, Tani said.

The critical uncertainties the model examined were the cost of making synthetic fuel, future energy needs, the prices of imported oil and events in the Middle East. In addition, sensitivity to a strong foreign oil "cartel" and the risk attitude of the nation were built into the model, Tani said.

Among the alternatives for which probabilities were assigned were three investment levels for synthetic fuel production: low, medium and high.

The decision analysis was reduced to a 400-line Fortran program that was run on a commercial time-sharing basis. None of the program alternatives for commercializing synthetic fuels were shown to be in the best interest of the country, and potential losses connected with this project were forecast in the $1.65 billion to $11 billion range, Tani said.

A bill subsequently introduced in Congress requesting appropriation for a minimal commercial synthetic fuel program was defeated, Tani noted. At the present time, however, synthetic fuel manufacture has not been entirely abandoned, he said, but rather has been funded through research grants.

CW Photo by A. Dooley

Electronic Memories & Magnetics had arches at the National Computer Conference, but no hamburgers.

Smith Charges 'Benign Neglect'

(Continued from Page 9)

puter industry for speaking out about the issue of privacy before it became an unsolvable problem, contrasting it with the matter of pollution.

Smith, in supporting his theory of "benign neglect" within the federal government, cited a number of federal agency plans to install various computerized information systems and plans to exchange information among data banks. "The federal government thinks the solution to every problem is to expand a data base," he said.

Among the instances he discussed was an Internal Revenue Service proposal to install computer terminals in each regional office so each regional office could have access to the data concerning any U.S. taxpayer. "That was clearly not necessary and fortunately was shot down by the Administration," he said.

He cited NCC Booth No. 2100, occupied by the National Technical Information Service, as a violater of the Privacy Act of 1974, since it offered for sale a mailing list of all CB owners in the U.S. "You can give away a mailing list but, according to the Privacy Act, you can't sell it," Smith said.

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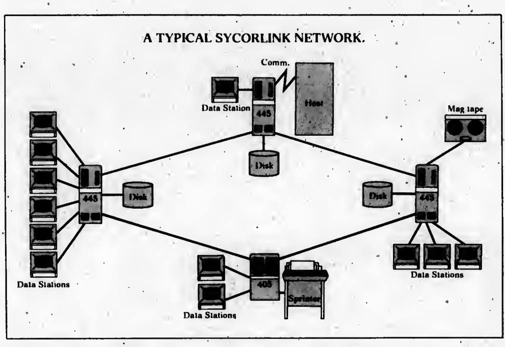

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Besides Usual Hobbyist Gear

Personal DP Festival Features Business Aids

By Tim Scannell
CW Staff

ANAHEIM, Calif. — The National Computer Conference's Personal Computing Festival here last week boasted the usual display of terminals, keyboards, CRTs and microprocessors aimed at the hobbyist, but it also featured a number of microprocessor-based business systems and software packages.

The Demarco-Shatz Corp. unveiled two Z80-based systems geared to both business and medical billing applications. The basic business system offered by the firm contains 32K of random-access memory (RAM) and features two RS-232 I/O ports, a 200 line/min printer and a 12-in. intelligent CRT, a spokesman said.

The system can accommodate up to four CRT terminal stations on a time-sharing basis and the memory can be incremented by 8K bytes for each added CRT. Also included with the system are 512K bytes of expandable floppy disk storage space, the spokesman said.

The medical billing system contains all the features of the business configuration except that it is supplied with 64K bytes of RAM, six I/O ports and a capacity for more than 10M bytes of disk storage space.

Software is also supplied by the company and included as a part of both the business and medical system packages, the spokesman noted. The business software consists of inventory control, accounts payable and receivable and general ledger, as well as sales entry, purchasing and a maintenance-type program.

The medical software is made up of facility analysis, patient billing and inquiry, charge ticket entry, receipt batch control, insurance preparation and physician analysis functions. The system is capable of preparing reports related to each of the billing areas.

Prices for the billing and medical systems begin at $15,900, which includes installation.

Problem Solver Systems, Inc. introduced a microprocessor-based, RS-232-compatible terminal with data rates ranging from 75- to 19.2k bit/-sec. The Little Computer Terminal (LCT) features programmable function codes, can accommodate 48 lines of data for scrolling and utilizes the full Ascii character and graphics set, a representative stated.

The unit also has a self-test analysis function, a modular structure and socket-mounted integrated circuits. Company representatives were unable to quote prices.

Business Software

The Space Byte Corp. of Los Angeles demonstrated a business-oriented applications package designed for use with its modular business computer. The software is included as a part of the computer system, a spokesman explained.

Optional software facilities offered include an inventory control package, a medical package, a word-processing routine and a program that produces mailing labels. Space Byte could not provide pricing information.

32K Unit From TEI

TEI, Inc. of Houston displayed a business system consisting of 32K bytes of RAM, a floppy disk controller and two Shugart Associates floppy disk drives, a CRT controller and keyboard. The system has both serial and parallel I/O ports and 22 slots for additional memory.

Software includes Digital Research, Inc.'s CP/M disk operating system, which contains prewritten programs to assist the user in performing routine processing tasks.

The price of TEI's RTS-22 system is $5,275. A desk-mounted version is available at an additional cost.

Three Systems

Meca, a California-based vendor, introduced three business systems at the festival. The first, System 1, is a development system with an 8080-based MPU with seven level vectored interrupts.

The system is S-100 bus-compatible and has 32K bytes of memory and 18 available slots on the mother board. It features a CRT monitor, keyboard, two parallel and one serial I/O port and a dual-drive tape cassette storage system.

The System 2 is a word-processing system for business applications. It is similar in construction to the System 1, but it includes an I/O Ascii IBM Selectric terminal/typewriter. The configuration also incorporates the Electric Pencil word-processing program.

The System 3 is a general business system with the same hardware in the previous two systems; instead of the terminal/typewriter, however, a Centronics Data Computer Corp. 80-column printer is supplied.

Each of the three systems' software includes a file management system with an editor, assembler, debugger, directory recovery and tape copy programs. Extended Basic is utilized as the language in each of the systems and the general business unit features a payroll program. The systems are priced at $3,300, $4,395 and $5,985 respectively.

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'Gluing Oranges to Pancakes'

Session Examines Language/DBMS Interfaces

By Don Leavitt
CW Staff

ANAHEIM, Calif. — Embedding a nonprocedural query language within a procedural programming language is like "gluing an orange to a pancake," a speaker told a National Computer Conference audience here last week.

The speaker was Charles J. Prenner, of the University of California at Berkeley, who admitted he had borrowed the phrase that expressed his feelings so well.

Addressing an NCC session on Programming Language Interfaces to Data Base Management Systems (DBMS), he said one of the major problems lies in the fact that the conventional programming language "has no knowledge of the data base" or of the management system that drives it.

Current interface techniques are weak, he told the overflow audience. A CALL statement does provide linkage but not necessarily enough information to make the interface particularly effective. A preprocessor approach is better, but even that is an awkward construct, sometimes leaving type checking and protection of objects in the data bases in doubt.

One of the most difficult problems in attempting to interface conventional languages with DBMS develops because programmers — and their normal languages — tend to consider data records as composite objects but DBMS do not. The systems provide just the field or attribute requested, and that can be very disconcerting, he said.

Other Interference

Two other factors interfere with the possibility of a generalized interface, he continued. Since some languages — and some DBMS — work from an interpreter and some utilize a compiler, they handle the whole concept of names and domains differently.

Even within the relational DBMS that are beginning to emerge, this distinction is apparent. Ingres, for example, is an interpreter-based system that provides great flexibility, supporting variable relational and domain names. By contrast, System/R, using a compiler, has more run-time efficiency but is limited to fixed relational and domain names because of its binding time requirements.

But, Prenner said, he and coauthor Lawrence A. Rowe have been able to at least postulate an integrated approach to the interface problem, particularly focusing on relational systems. Such an approach should support a unified-type system for the definition of "language" objects and "data base" objects, the professor noted first.

It should provide an interaction based model of the data base operations and a better match with common programming language facilities. It has to allow variable binding times to cope with the variations in the possible DBMS. And it has to provide a vehicle for abstract data types, recognizing the varied views of different users, integrity constraints and the different trigger mechanisms within DBMS, he continued.

In response to a question, Prenner said a language supporting such an integrated approach should be ready in about two years.

The other speaker at this session was Prof. Stanley Su of the University of Florida, and his concern was the effort needed to convert from one DBMS to another or to accommodate data base changes, even if the DBMS is unchanged, with the least possible rewriting of the application programs.

He reminded the attendees that there is a wide range of reasons for reorganizing or restructuring a data base including changes in the user environment, changes in an installation's hardware or software, modifications for efficiency and changes in the data base semantics appropriate to the situation.

The original programmer works with a knowledge of the original data base and that is perfectly natural, he admitted. But it can create problems for those handling the restructuring: tests for possible, but admittedly unlikely, conditions may have been left out but need to be added in the rewrite.

'Translation' Process

In his work, Su noted that there are several ways in which a data base and the relationships needed to access it can change over time and that a "semi-automated" approach seems to be able to cope with all of them.

Su proposed a six-step "translation" process that should successfully move a data base query under an old DBMS to an equally effective query in a new DBMS setting.

This included a translation dictionary development that utilizes descriptions of the old and new settings to create tables matching such things as old names and old data relationships with new names and relationships. From there, the system analyzes the source data base query and begins the query translation effort in global terms.

Working with the tables created in the first step, the process continues with what amounts to a "pretranslation effort" to match new and old factors. A formal translation algorithm, the fifth step, leads to creation of the query in the new setting.

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Boon to Software Design

ANAHEIM, Calif. — The current methods of designing and developing software are "intolerable" and must be replaced with an engineering approach and "software on silicon," a semiconductor industry representative told computer designers and programmers here last week.

Speaking at a session on semiconductor technology and its affect on computer architecture, Robert Heikes, assistant general manager of Motorola, Inc.'s semiconductor operations, said that if the present ways of designing software continue, the growth of semiconductor technology could be seriously limited.

That will not happen, however, because semiconductor technology is an "inexorable" force pressing for change, he added.

Very large scale integration is an "irresistible force" that will overcome the "immovable object" of software, he said to loud cheers from the packed session.

Based on the present curves, he pointed out, there should be — and will be — 256K chips by 1982, and he half facetiously pointed out that if the current rates of progress continue, there will be one transistor for every electron on earth in just 200 years.

While that may be a little far-fetched, he said the progress in the semiconductor technology over the

(Continued on Page 16)

Semi, Computer Technology At Crossroad, Panelists Say

By E. Drake Lundell Jr.
CW Staff

ANAHEIM, Calif. — Semiconductor and computer technology is at a crossroad as the semiconductor manufacturers continue to bring out larger and larger systems on a chip, panelists agreed here at the National Computer Conference last week.

At the same time, there is a changing interface between the two groups, Gordon E. More, president of Intel Corp. and session organizer, said.

Each year, the semiconductor industry has been doubling the complexity of the systems it can put on a chip, and the trend will continue, Moore said.

The challenge will be to keep up with these changes in technology, he added.

Because of the changes, Moore said the development of computers is limited less by the technology than by the ability to take advantage of the increased size and ability to pack more complexity in less space.

In the next few years, chips will be available with plenty of space for lots of additional functions beyond the memory and logic functions now available, he indicated.

Because of this, the "opportunity for significant changes" is greater now than it has been in the past, and designers should not use this increased space just to pack on more logic and memory but should think innovatively, he said.

No Longer Just Components

Lester Hogan, vice-chairman of Fairchild Camera and Instrument Corp., agreed, noting that in the age of LSI and very large scale integration (VLSI) it is no longer possible to view semiconductors solely as components.

In the past, he said, the relationship between the semiconductor industry and the computer industry has been one of synergism, but at present there are strains on the relationship.

The expected chips with one million components will not be components only, he said, and will have to be designed as part of the total system. Technology is at a juncture, he said, where there must be feedback from the computer architects to the circuit designers in order to do this.

At the same time, for the foreseeable future the semiconductor industry will build memory chips better than the computer industry does because the semi industry's high volumes make its prices hard to beat.

For the synergism to continue between the two industries, computer architects need to find ways of using chips that can be mass-produced rather than customized for applications, and they should consider multiprocessor microcomputer systems for their designs.

Emphasis Shifting to Software

Bernard H. List, manager for MOS in the U.S. at Texas Instruments, Inc., told the computer architects that they can expect the exponential gains in semiconductor technology to continue at their present rate.

But at the same time, he indicated that the emphasis of the semiconductor houses will be shifting so they can put more emphasis on micro system software than on hardware.

Presently, software accounts for about 20% of the semiconductor firms' efforts, he said, but this will increase to around 50% in the coming years.

For the foreseeable future, there are no technical limits in sight for semiconductors, he said, predicting that electron beam etching methods will be used soon and X-ray etching will be possible in the mid-1980s.

And the market for the products will also continue to explode, he indicated, predicting that the advances in semiconductor technology will really make distributed processing possible and economically feasible.

Joseph F. Kruy, president of Cam-

(Continued on Page 16)

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Semi Advances to Help Improve Software Design

(Continued from Page 15)

next decade will destroy the basis of the present way software is developed and will create an entirely new way for developing software.

Software development today is labor-intensive and there is little automation to support that effort. Furthermore, it is extremely expensive, he said, noting that there will be 64K-bit microcomputers in 1979 that sell for around $750 while it still costs as much as $100,000 to develop a payroll package. And the divergence between the two is increasing, he said.

Because of this, the semiconductor manufacturers will begin putting software on silicon chips instead of allowing it to be developed under the present methods, he said.

Reliability will be the key to this type of "software," he said, and will be the main area pursued by developers.

The software will have to be reliable, he said, because the semiconductor industry will be shipping more processors per day in 1980 than the entire minicomputer industry shipped during 1978.

Some applications "programmed" into silicon, he said, will be sold in the millions, and in such applications the units will have to be extremely reliable. Because of the need for reliability, the semiconductor manufacturers will bring the discipline of engineering to the area of software development, he predicted.

Today most programs are written with little of this discipline, he said, and they lack the formal design specifications needed by engineering, the formal methodologies for design and testing and the documentation that is a part of any engineering design effort.

Better methodologies will eventually be used, he said, adding that the semiconductor houses have already started by putting architectural features into their systems to support higher level languages. He predicted that systems software will be written on silicon by 1990.

And with such a system — and the formal engineering discipline — he predicted that software cost could go from $10 per line of code today down to only 5 cents per line when incorporated in silicon.

Two Fields At Crossroad

(Continued from Page 15)

bridge Memories, Inc. and the computer industry's representative on the panel, agreed with the predictions of the semi makers, but said there is a need for novel approaches to chip design for distributed applications.

"Chip complexity is not itself a solution," he said, adding that microprocessing has to be coupled with the movement to distributed DP and that the chips must provide communications functions as well as processing.

This will require integrating software into hardware.

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But DP Trainees Cleared of Fraud

Charges Against Prison Site Led to Crime Bill

By Edith Holmes
CW Staff

ANAHEIM, Calif. — A false accusation that a software house running inside the U.S. Penitentiary at Leavenworth, Kansas, and staffed by its inmates was defrauding the Internal Revenue Service (IRS) led to the introduction of the first computer crime bill in the U.S. Senate last year.

The Leavenworth Prison's software firm — a rehabilitation effort designed to teach inmates to be competent programmers — has since dealt with the adverse publicity and revamped its security program to meet the perception as well as the reality of risks to the public, according to Willard V. Handley, manager of data graphics products for Federal Prison Industries, Inc.

Speaking at a session on computer crime at the 1978 National Computer Conference here last week, Handley said the charges of fraud by the IRS initiated congressional investigations that culminated in Sen. Abraham Ribicoff's (D-Conn.) introduction of S. 1766 a year ago. In addition to the drafting of that bill — before the Senate again this year and scheduled for hearings by the Senate Judiciary Committee's Subcommittee on Criminal Laws and Procedures on June 19-20 — the Leavenworth controversy also caused the prison to conclude that its security program was "too esoteric."

Recidivism Rate Reduced

Leavenworth's software firm falls under the operating guidance of Federal Prison Industries, a federal agency that operates more than 70 factories in 32 penal institutions across the nation, Handley explained. Programming at Leavenworth is but one activity sponsored by the agency; others include the manufacture of footwear, office furniture, textile and electronic products and the production of such services as printing, bookbinding, architectural drafting and data entry.

Security is "second nature" to the prison staff that operates Leavenworth's computer programming firm, an effort that by June 1976 led to the placement in private-industry jobs of 24 of the project's 48 inmates released from incarceration, Handley said. Only 15% of these former inmates who learned programming at Leavenwroth have ended up back in prison, compared with a national return rate of nearly 50%, he added.

At Leavenworth, four teams of seven to eight inmate programmers and two teams of four inmates training to be systems anlaysts work with computer professionals and a support staff of maintenance and marketing personnel. Using a U.S. Department of Agriculture NCR Corp.200 located in Kansas City — and until the IRS incident, commercial time-sharing services — the Leavenworth software house sells its programs to several federal agencies.

One Inmate's Scheme

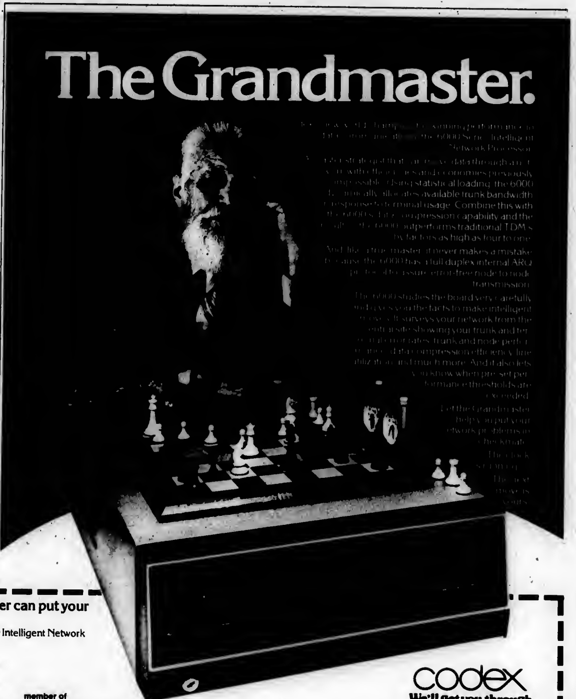
Problems developed between the IRS and the prison software house when, unknown to either of them, a Leavenworth inmate discovered he could defraud the IRS by sending in phony tax returns reporting money he had not earned and bogus W-2 forms showing taxes that had never been withheld. Banking on the fact that the IRS rarely matches the wage amounts reported by employer and employee, the Leavenworth inmate had refund checks sent to an accomplice on the outside.

When an IRS investigator uncovered the fraud, he felt sure the IRS computer system should have kicked one or more of the inmate's returns out for audit and concluded the Leavenworth software firm must have had a hand in assisting the returns through the IRS computer checks, Handley said. Specifically, the IRS investigator thought the inmate had used the Leavenworth computer shop to penetrate the IRS system through the Computer Science Corp.'s Infonet, the commercial time-sharing network employed by the prison and the tax agency.

"We knew that this couldn't have happened, that our computer system was secure," Handley said. Leavenworth called in an independent contractor, the Mitre Corp., however, to study the prison's computer security.

Because Leavenworth's inmates are under constant supervision and security is a normal, everyday consideration at the prison, Mitre concluded, "the security procedures in use at this

(Continued on Page 18)



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DP Crime Bill Spurred By False Charges of Fraud

(Continued from Page 17)

time are probably stronger than those used in most software development shops and are more adequate for the types of programs (chiefly report-generating programs) currently being developed."

But despite the orientation of this software firm toward turning inmates into accomplished programmers, the strict control of comptuer runs, the selective process used to choose programmer and analyst trainees and the encouragement to federal agencies to test the software products purchased from the Leavenworth operations, Mitre also determined that "it was too much to expect the uninformed public to understand the threats they perceived weren't real."

Theoretically, Handley said, the inmate programmers could acquire outside programs by penetrating a time-sharing service in use at Leavenworth. They could penetrate the in-house computer's operating system and install software modifications — trap doors or "Trojan horses" — there. Federal Prison Industries decided the only way to defuse these possibilities was to isolate the user systems completely from the program development work at Leavenworth.

No More T/S

Accordingly, today the prison no longer uses time-sharing, putting to an end the original plan to acquaint the inmate programmers with additional computer systems. The only item that flows from the program development effort at the prison to the federal agencies which are its clients is a card deck containing the software developed and tested on a Department of Justice computer system, Handley noted.

The IRS-Leavenworth "scandal" raised a variety of security issues. But perhaps even more serious for the life of the rehabilitation program at the prison, the controversy caused the public to question whether the federal government should turn known criminals into computer programmers, he said.

Handley stressed the selection process the inmates undergo and the training they receive. "An inmate wants most of the same things out of life that we desire — money, status, security. The criminal is someone who exhibits less patience to acquire these things," he said.

Inmates must be patient if they succeed in passing the standards required for participation in the program — a high school or equivalent degree, a 10th grade general math and language arts performance ability and a minimum score of 45 out of a possible 90 points on the IBM Programmer Aptitude Test. Once in the software house, they must spend a year in intensive classroom training and two to three years producing programs.

Then, Handley said, the inmate has to be released from prison and to find a DP job. The impatient simply don't last.

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Euronet to Include 100 Data Bases

Europeans Planning Packet-Switched Network

By Ronald A. Frank
CW Staff

ANAHEIM, Calif. — Nine European countries are working together to establish an international public packet-switched network in Western Europe, according to George Orchard, head of international data transmission policy and strategy for the British Post Office.

Called Euronet, the network will enable data terminal users of the European Economic Community (EEC) to gain access to data bases holding specialized scientific, technical and socioeconomic information, Orchard told a National Computer Conference session on international data networks here last week.

Euronet will be operated jointly by the postal, telephone and telegraph (PTT) administrations of the network's nine member countries. Euronet was conceived after studies showed European taxpayers could benefit by having a single, shared network rather than a number of separate nets, each providing one segment of the same total service.

Because Euronet will utilize packet-switching techniques, users will not be penalized because of geographic location. Rates on the network will be for the most part volume-sensitive and distance-independent, so all users will be served on an equal footing, Orchard said.

22 CPUs, 100 Data Bases

Euronet will have four nodes with Packet-Switching "Exchanges at London, Frankfurt, Paris and Rome. Remote access facilities will be provided by multiplexers in Amsterdam, Brussels, Copenhagen, Dublin and Luxembourg.

Transmissions between the PSEs and on the major links will be at speeds of 48k bit/sec, while the remaining multiplexers will operate at 9,600 bit/sec, according to Orchard.

A network management center will be set up in London. When Euronet begins operations early in 1979, the first of an expected 22 host CPUs offering access to about 100 data bases will be connected to the system.

Low speed start/stop character mode terminals will access the net at speeds ranging from 110- to 1,200 bit/sec while packet mode synchronous terminals will operate on Euronet at speeds ranging from 2,400- to 48k bit/sec. Some user terminals will be connected to Euronet directly via private lines; many start/stop devices will gain access using the switched telephone network, Orchard explained.

Access to the network will be by two modes. The first of these is a virtual call; users will also be able to utilize a permanent virtual circuit.

The permanent virtual circuit establishes a network connection on a permanent basis, similar to a dedicated point-to-point private line, Orchard said.

Euronet will be based on the CCITT X.25 standard, although some variations will exist. A packet assembly/-disassembly (PAD) facility will be established to handle start/stop devices and the network will include a Network User Identifier (NUI) for billing purposes.

The network is not "basically restricted" to the nine-member countries of EEC, Orchard said. Switzerland and Spain have already applied to participate, he noted.

X.75 Described

Another speaker at the session, Masanori Amano, staff engineer at Kokusai Denshin Denwa Co. Ltd. (KDD), the Japanese international common carrier, described the CCITT X.75 standard for the interconnection of national packet-switched public data networks.

The X.75 standard has a three-level structure made up of physical, frame and packet levels. Internetwork administrative signalling functions such as routing, flow control and accounting are provided as well as call set-up, transpar-

(Continued on Page 28)

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Low-Cost Satellites Urged for Public Service

By Marguerite Zientara
CW Staff

ANAHEIM, Calif. — Since libraries, educational institutions, health centers and local government agencies are among the emerging markets for satellite data communications in public service, common carriers and major public service institutions should make an effort to keep the costs of such services as low as possible.

That sentiment was expressed by James G. Potter, director of planning and analysis for the Public Service Satellite Consortium (PSSC) of San Diego, at a session on "Satellite Data Communications for the Public Service Sector" at the National Computer Conference here last week.

Frank W. Norwood, executive director of the Joint Council on Educational Telecommunications in Washington, D.C., the only one of three scheduled panelists to participate in the session, noted there is interest in extending public services to all citizens within an inexpensive framework, thereby increasing the quantity and quality of these services. Satellite technology lends itself very well to this goal, he said.

Contrasting the logistical considerations of satellites with terrestrial communications systems, Norwood said satellite systems are distance-insensitive, terrain-insensitive and less climate-sensitive than terrestrial systems. In addition, the cost of satellite systems does not depend on the density of population in an area, as does telephone service, for example.

While Russia and Canada developed the first domestic satellite systems out of a need to reach scattered populations, the U.S. could use such a system to join nongeographic communities of interest, Norwood said. Congress and the White House are interested in creating a "new rural society" via the dispersement of information, thereby eliminating the need for people to "crowd together in cities" to enjoy such information accessibility, he added.

With fewer, more powerful channels in a satellite system, ground stations could make use of smaller and less sophisticated equipment for receiving communications, thus increasing the economic feasibility of such systems, he pointed out.

Potter noted the 1982 potential demand for satellite communications capacity from public service users, as indicated by a recent PSSC study undertaken for the National Aeronautics and Space Administration's (Nasa) Goddard Space Flight Center, was projected under four assumptions.

The first assumption is that an appropriate, affordable satellite communications network will be available; the second is that there will be no gap in the development of public service satellite communications; and the third is that organizations will benefit economically from such networks.

The last assumption is that modest organizational changes will be required for users of such systems.

Four Markets

In discussing the four emerging markets, Potter began with the U.S. health care system. He said the three opportunities most likely to lead to extensive utilization of satellite communications for health care involve the aggregation and sharing of computer power, data bases and software for use in hospital information systems for accounting, billing, inventory control and patient records; clinical support systems for radiology, cardiology and pathology; and audiovisual materials and programs for computer-managed instruction to support the continuing educational requirements of various professional groups in hospitals.

The projected 1982 revenue in this area is $49 million and the projected 1982 volume is 1.7 by 10^{13} bit/year, Potter said.

A survey conducted in 1976 by PSSC indicated 81% of its membership expressed interest in a network for continuing education, with response strongly oriented toward one-way video, Potter said. On the basis of this response, PSSC projected a demand for 12,000 channel-hours of one-way video in 1982, representing an annual revenue of about $4.8 million.

Three protected transponders will provide adequate service for the demand, PSSC predicted. Assuming the 12,000 channel-hours figures and 1,000 students per class, Potter said, only 6 by 10^{9} bit/year need to be transferred.

In the area of federal and state government agencies' equipment maintenance, Potter said the use of telemetry, microprocessors and telecommunications probably could effect "tremendous savings" in equipment maintenance and load management of various resources such as power, water, light and heat. The projected potential satellite traffic revenue in public service agencies is $32 million, and the projected annual transmission rate is 4.3 by 10^{11} bit/year, he said.

Requirements to support "technical services" in American libraries such as cataloging, serials, control, acquisitions, circulation and interlibrary loans were based on the present budget of the Ohio College Library Center which now spends about $2.3 million annually on leased terrestrial lines to reach 1,100 libraries in 44 states.

The potential revenue in 1982 for technical services was estimated at $4 million. The potential volume of satellite traffic in 1982 was projected at 4.8 by 10^{10} bit/year, according to PSSC.

1

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Users Told of Ongoing Studies

Software Conversion 'As Inevitable as Taxes'

By Brad Schultz
CW Staff

ANAHEIM, Calif.— Software conversion is a "disruptive, largely nonproductive process" that a DP organization must face at some point in its life with the fabled inevitability of death and taxes. So said panelists here last week at a National Computer Conference session addressed to conversion problems.

The session chairman, Alan Merten of the University of Michigan, remarked that the subject of software conversion is now a discipline of spirited study by DP users and computer scientists at a time when people's attitudes toward death are widely discussed and the fundamental principles behind taxes are under reassessment if not attack.

Conversion is the process by which computer programs are modified to enable their correct execution on a CPU other than that for which they were devised. Most DP organizations considering conversion have at least 1,000 to 1,500 programs in stock with half of these programs effectively obsolete, according to Mayford Roark of Ford Motor Co.

The obsolete programs typically are "fragmented" or were not written via a top-down approach or are not structured as is presently the vogue, Roark said, adding that state-of-the-art software must be adaptable to data base management systems (DBMS), yet only 10% to 20% of existing programs have this flexibility.

A large portion of standing software is thus in imminent need of conversion, Roark indicated, offering his estimate that the U.S. contains a total investment in programs of $100 billion to $200 billion and must therefore spend enormous sums of money in keeping its software usable by the latest processors.

Government Plans

Paul Oliver of the U.S. Navy cited a 1977 General Accounting Office report that the federal government spends $450 million annually on software conversion. A federal conversion support center has been planned over the past three years, Oliver noted, explaining that the center is intended to provide assistance to federal agencies undertaking conversion.

The center would offer resources and expertise to facilitate the design and implementation of conversion projects, but would not try to supplant the conversion services available from private-sector vendors, Oliver said.

The federal government is also planning to establish standards in conversion methodology through the National Bureau of Standards (NBS), Oliver continued, indicating that he has long supported the idea of standardization in this instance but is "beginning to wonder why" in view of the bureau's difficulties in devising and promoting its Federal Information Processing Standard series.

A report by the conversion technology panel that recently met at a workshop jointly sponsored by the Association for Computing Machinery and NBS, entitled "Data Base Directions — The Conversion Problem," was discussed by James P. Fry of the University of Michigan, one of the report's authors.

The report concluded that hardware development "will increase the need for generalized conversion tools," Fry said, explaining that the proliferation of minicomputers, computer networks, mass storage devices and distributed data bases is greatly enhancing the need for software adaptable to a diversity of processor environments. And the situation is accelerating, he noted.

The expected reduction in hardware costs will keep down the costs of conversion, the report also found, and "special hardware DMBS machines (SHDBMS) will be available to simplify conversion by promoting logical level interfacing.

Software advances will not eliminate the need for conversion, but may facilitate the process in a manner similar to SHDBMS, the report predicted, adding that several logical models for DBMS interfacing are likely to appear, compounding the need for conversion tools between DBMS.

Standards will not eliminate the need for conversion but may greatly simplify the process, the report said.

Conversion should be carried out by qualified contractors, Oliver advised, adding that developers of the software being converted tend to be ill-suited to undertaking the conversion themselves because they are "too imaginative" and may try incorporating improvements in the software as they convert it.

Software should not be "improved" just before or concurrently with the conversion process, Oliver said, explaining that even conspicuous flaws should be allowed to pass through.

However, developers of the programs under conversion must participate in the process, contributing their insights as needed by the converters, Roark stated. Using a baseball analogy to make his point, Roark noted that unless developers and converters cooperate effectively, "the ball will drop between two outfielders."

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International Data Users 'Demanding Breed'

By Ronald A. Frank
CW Staff

ANAHEIM, Calif. — Data communications customers are a demanding breed who want new technology to be introduced fast. If it is not forthcoming, they attach a very valid threat of taking their business elsewhere or doing it themselves, according to David Horton, development director of computer communications for the Hawaiian Telephone.

Speaking at a National Computer Conference here last week on international computer communications regulations, Horton described packet-switching technology as a "hyperactive child" that is constantly exploring new possibilities and often getting itself into a little trouble.

The pace of change in this area is higher than in any other area of telecommunications, and with the introduction of microprocessors, third-generation equipment is already being used only three years after the first packet went into commercial service, he said.

The branches of packet switching now encircle the world. At last count, there were almost 20 such networks in service or about to begin operation. Today, there is extensive access to North American data bases by European customers using packet networks and similar plans are under way in the Pacific area, he noted.

Special emphasis is being given to the emergence of Korea, Taiwan, Singapore and Hong Kong as the "new Japans," and as trade with these areas increases, the need for more telecommunications traffic will grow.

In response to a later question, Horton said he expects to see network service for these Pacific rim countries within the next 18 months.

Regulatory Delays a Problem

If the demand for increased telecommunications services is to be met, ways will have to be found to eliminate the regulatory delays that now hamper the introduction of new services, Horton said.

Simply increasing the staff of the Federal Communications Commission (FCC) is not the answer, he said. Instead, he suggested steps should be taken in the regulatory area.

First, the FCC should establish guidelines and policies for international telecommunications. The roles of individual carriers should be clarified with regard to segmenting their areas of authority, and the commission should anticipate the kind of actions that will be necessary based on technological advances and market demands, he said.

There must be a thorough understanding of what technology can do, what the customer wants and what the various vendors are trying to achieve. Then, regulations must be produced which are fair, which stimulate innovation and keep prices as low as possible, he noted.

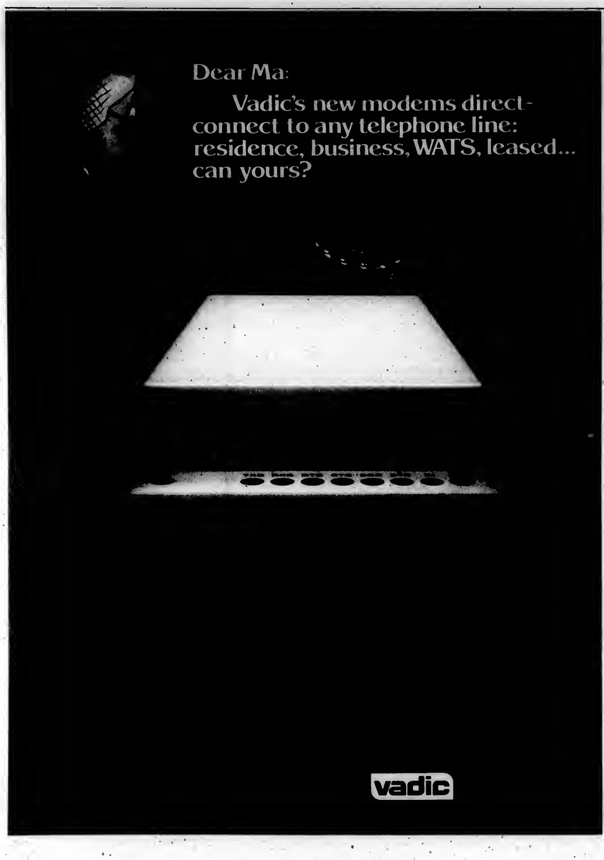
The carriers should play an active role in this effort to streamline regulation, Horton suggested.

Private-Line Rates

Speaking on a particular aspect of international telecommunications policy, Phillip Onstad, manager of telecommunications policies at Control Data Corp., expressed concern about attempts to eliminate flat-rate private-line services in favor of volume-sensitive packet offerings. Large users should retain the option of electing the use of private-line flat-rate services if they see this as more beneficial than packet offerings, he said.

Large time-sharing compa-

(Continued on Page 26)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But Some Applications Lagging

Packet Nets Gaining Some Ground, Users Told

By Marguerite Zientara
CW Staff

ANAHEIM, Calif. — There is a growing need for specialized packet-switching network systems in the U.S. and efforts are being made to fill that need in a number of areas. That was the thrust of a well-attended session on nationwide packet-switching networks here last week at the National Computer Conference.

The Department of Defense (DOD) is presently developing the Autodin II system to bring the new technology to an already established environment, according to Donald O'Rourke, associate director of the Civil Service Commission. Autodin II, which will be in use in 1980, will not supersede the existing Autodin I store-and-forward message-switching technology, however. It will supplement it via parallel operation for the most efficient transfer of bulk transaction and interactive data, O'Rourke said.

Developed and implemented in the early 1960s, Autodin I communicated on a worldwide basis. The system traffic has grown from 625 million lineblocks (one lineblock equals 640 bits) in 1972 to over one billion lineblock/mo in 1977, O'Rourke said.

DOD studies indicated that by the mid-1980s there will be approximately 2,500 computers with about 20,000 terminals involved in on-line communications. Therefore, the decision was to use common-user rather than dedicated networks to ensure the most efficient and economical service possible.

System Connection

High-speed interconnect channels will connect the two systems, O'Rourke said. The message-type traffic handled by Autodin I will be transferred over these dedicated links to Autodin II and then transmitted over a common high-speed transmission network, thereby providing users with a choice of two data switching facilities through a common transmission network, according to O'Rourke.

Security requirements of the system will necessitate personnel, physical, administrative, communications, emanations and software security, O'Rourke said. Elements of software security include a packet-switching node (PSN), transparent terminal interface, transparent host interface, transmission network, encryption equipment, test facilities at each center and a central network control center at the headquarters, he noted.

The control center will monitor the operational status of the circuits, the switching computers and the user computer and will assist in diagnosing and correcting malfunctions using the PSN's Digital Equipment Corp. PDP-11/70, O'Rourke said.

A patch and test facility will monitor circuit reliability and quality, O'Rourke said.

Other Areas Lagging

Although the military is forging ahead, the same cannot be said for higher education and science research, according to Ronald Segal, director of research and development for Educom, Interuniversity Communications Council, Inc. of Princeton, N.J. The reasons, he said, are economic, political and organizational.

One of the problems is that many educational institutions are unprepared to modify their computer facilities, Segal noted, even though most institutions believe strongly that they must have a major computer facility on site if they are to maintain their research and educational positions. Incentives for sharing are missing both for the buyer and seller of services, at the level of both the individual and the institution, he explained.

Further, unfair competition exists in that not all institutions that might belong to the network are bound to operate under the same pricing regulations. In addition, institutions that might potentially offer computer services over a national network have shown little willingness to provide service guarantees to outside users, except in special cases, he said.

Unique quirks at single computer sites also constitute a barrier to use of outside services, Segal said. In addition, the network overhead involved in such a system would discourage institutions that wanted only to distribute or gain access to a small volume of services, he said.

Since current systems provide inadequate protection against malicious or unintentional access to system resources, Segal observed, most institutions will choose not to maintain sensitive data on remote storage devices accessible via a network.

Finally, unresolved legal and regulatory issues stand in the way of such a system. For example, can a nonprofit educational institution freely sell computing services and still retain its nonprofit status? he asked.

Segal concluded by saying that while barriers exist to the establishment of such a national network, attitudes toward networking are positive and constructive and top-level administrators are becoming involved in the issue.

The likely deciding factor, he said, is whether or not short-term payoffs can

(Continued on Page 24)

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MEMOREXCELLENCE

CW Photo by A Dooley

A terminal caught Dad's eye at the National Computer Conference last week, but Junior found a passing photographer's camera more fascinating.

National Packet Networks Gaining Ground in U.S.

(Continued from Page 23)

be made attractive enough to sustain interest during the difficult development period.

View of Telenet

Jay Hoffmeier, senior systems analyst for Telenet Communications Corp., presented a highly technical description of the hardware architecture of Telenet's public packet network. His associate, Roy Spitzer, also a senior systems analyst, discussed in detail the system's software architecture. Spitzer stated that the Telenet system satisfies the following user requirements: high processing power, large memory capacity, flexibility, low cost and a variety of interfaces.

Wrapping up the session was Gilbert Falk, senior computer specialist at Bolt, Beranek and Newman, Inc. of Cambridge, Mass., with a comparison of the network architectures of Arpanet and IBM's Systems Network Architecture (SNA).

Architectural similarities in the two designs result from fundamental similarities of objective, Falk said. The architecture goals of both networks are to support distributed processing and to facilitate resource sharing, he noted.

Both designs have attempted to provide a single-purpose interprocess communication facility upon which application-level communication rests. Both architectures also seek to separate the DP and data communications functions, Falk noted.

Considerable Difference

But the networks differ considerably since Arpanet was developed for operation within a research environment, while SNA was developed for use in a commercial environment, Falk noted. Furthermore, SNA was designed to provide a networking capability for equipment from a single vendor. Arpanet, on the other hand, was developed to provide a networking capability for subscriber equipment from many different vendors, Falk noted.

Finally, SNA is an implementation-independent architecture, while Arpanet is an evolving implementation of the general concept of packet switching, he pointed out.

Architectural Characteristics

Comparing the key architectural characteristics of the two networks, Falk said they have the same store-and-forward packet-switching technology. Routing for SNA is centralized static, while Arapanet's is distributed adaptive, he said.

In SNA, segmenting and reassembly can be performed at each node, while for Arpanet, data is packetized at the source node and reassembled at the destination node. SNA has blocking/-deblocking while Arpanet does not.

In sequencing, basic information units (BIU) and BIU segments are kept in order over the entire path for SNA. For Arpanet, the packets are reordered at the destination node, Falk said.

SDLC vs. Arpanet

Although Synchronous Data Link Control (SDLC) and Arpanet's IMP-to-IMP protocol both support communication over transmission circuits, they differ in several respects, Falk said. SDLC implements data transparency by bit insertion in the data stream while transparency in the Arpanet protocol is based on the doubling of DLE characters, according to Falk.

Under SDLC, a variety of data link configurations are supported, including point-to-point, mutlipoint and loop, but IMP-to-IMP is designed only for dedicated full-duplex point-to-point links.

In addition, a variety of network elements with different physical capabilities are accounted for under SNA, whereas only a single type of network element exists in the Arpanet design, according to Falk.

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DP85/CW6128

Performance Management Overdue: Kiviat

By Edith Holmes
CW Staff

ANAHEIM, Calif. — Computer performance management is "way overdue" and should be defined, not by CPU utilization, but by how well a DP system delivers services, according to Philip J. Kiviat, technical director of the Federal Computer Performance Evaluation and Simulation Center (Fedsim).

How well a DP system delivers services depends on what users want and what they feel they get out of their organization's computer operation, Kiviat and other speakers at a National Computer Conference session on computer performance measurement agreed here last week.

Often considered "nice but not practical," performance measurements must be commonly understood by DPers and users if they are to be useful, accordingto Richard J. Cieslowski of Aetna Life & Casualty.

All the software and hardware monitors currently available and in use won't tell an organization as much about the performance of its DP system as the combined performance perceptions of its DPers and the system's users, he suggested. Cieslowski also stressed the users' responsibility to share the task of defining and improving system performance.

The Aetna official's observations stemmed from the insurance company's experience with its Employee Human Resource Data Bank, which contains personnel records and handles Aetna's payroll. The system covers 30,000 employees throughout the U.S., Canada and Puerto Rico, processes 1.2 million transactions per year and annually turns out 350,000 personnel reports and 860,000 paychecks, Cieslowski said.

Initially, the DP staff supporting the technical aspects of the system numbered 19, while 39 payroll and personnel employees worked with this personal data.

Two years after the system was installed, problems developed in the form of backlogs, high processing costs and low service levels. A 33% increase in personnel failed to solve the problems the system was experiencing, and the organization tentatively decided more advanced computer technology was the answer, Cieslowski reported.

'Perception' Problems

At this point, a project team of DPers and personnel/payroll employees was formed to evaluate the system against selected performance criteria. To the team's and Aetna's surprise, the team discovered their existing DP operation met the standards they had established. "The difficulties were problems of perception requiring education rather than new hardware and software," Cieslowski said.

Aetna revamped the manual aspects of the system, saving the $200,000 a change in hardware would have cost. The company also realized staff reductions of 50% in DP and 10% in personnel/payroll, he stated.

In the course of its study, Aetna found that its DP department placed too much emphasis on mechanical measures and not enough on user satisfaction. Advancements in technical performance are not usually the answer to performance problems, Cieslowski told the NCC audience. More often the key to solving system performance difficulties is the user's realization that he has not used DP resources effectively, he said.

Once objective criteria for evaluating the collective performance of the DP and user operations have been established through communication and feedback between these groups, employee overtime and work backlogs melt away, Cieslowski noted.

Standards established and closely monitored can provide still another benefit: They can alert an organization to the approaching need for an upgrade or replacement, he said.

He cautioned his audience to set performance standards at the highest management levels of their DP and user operations, to regularly monitor performance criteria and to refine standards when necessary. If standards aren't revised and replaced periodically, all the gains initially made through performance evaluation can easily be lost, Cieslowski said.

Involve Top Management

Echoing the notion of a "top-down" definition of standards, Stephen Lowry and David Schaefer, also with the Air Force's Fedsim, argued in their NCC paper for the early involvement of top management in the definition of information requirements and system performance criteria.

Central to their approach to implementing a "performance management system" is the concept of "thresholds," basic process control measurements to tolerances within which the system must operate if it is to perform well, Lowry said.

Hailing from the University of California at Berkely, David F. Stevens suggested many popular performance measures are meant to "obfuscate" the system's actual operation, telling the story the DP manager wants told to the users.

Stevens poked fun at common measures of system availability and reliability, throughput, turnaround and general productivity, suggesting, among other things, that "judging a programmer by the number of lines of code he writes is like judging Homer by his lines of ode."

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GENERAL ELECTRIC

Panel Looks at Future Word Processing Gear

By Ronald A. Frank
CW Staff

ANAHEIM, Calif. — As functions are added to word processing systems, it is important that people operating the systems are not forced to change their work habits to conform.

Additional capabilities will transform these units into office automation systems, according to David Moros, director of new product development for Wang Laboratories.

Speaking at a National Computer Conference session here last week on hardware architecture for office automation, Moros said the time is coming when electronic mail, intelligent copiers and even large business CPUs will be interfaced to office systems.

The next big area to be added to word processing is communications, according to Paul Mangione, director of product planning at Lexitron Corp. Today, only 10% to 15% of the installed word processing systems have communications, but a true communications environment for this type of system is just beginning.

The latest systems from Lexitron have RS-232 interfaces to support communications devices and users are being offered features such as IBM 2741 compatibility, Mangione noted.

Word processing systems began as hardware-only equipment. They evolved first to firmware and then to full software systems that offer users greater flexibility and protection against their systems becoming obsolete. The original systems from Lexitron had 18 printed circuit boards and this has now been reduced to about seven, he said.

This evolution means that users now have programmability and the systems are easier to maintain because software diagnostic routines can be run on the systems, Mangione said.

An attendee at the session asked why none of the vendor representatives had talked about standards. He said that word processing systems had little uniformity and this left the user in a bad position.

Jack Gilmore, group product line manager of word processing computer systems at Digital Equipment Corp., agreed, saying that vendors today are engaged in a features war to provide users with the capabilities they want. But standards will come later as communications capabilities grow, he added.

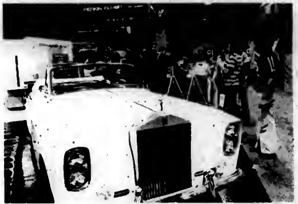
Another attendee, Tony Rybczynski of Bell Canada, asked the speakers whether they saw an eventual interconnection between digital PBXs and office automation systems. Mangione replied that these PBXs would become the bus structures of future office automation systems with workstations and other peripheral devices being interconnected through the PBX.

Moros said that even though most word processing systems are stand-alone single-station units, the multiple user system will become popular because it offers certain advantages. Multiuser systems allow cost-sharing, more on-line storage, greater speed and a variety of functions.

Other advantages include device sharing, such as the ability to use several printers in parallel, he added.

A natural evolution will be the interconnection of phototypesetting systems to word processing units so that direct input will eliminate the need for rekeyboarding, Moros said.

Gilmore said that at present, 40% to 50% of company costs can be traced to the office, but productivity in this area has not increased to keep pace with the rise in clerical wages. Office productivity has gone up only 4% since the 1960s, thus making it feasible for most users to investigate word processing systems.



CW Photo by A. Dooley

Perkin-Elmer photographed attendees in a 1959 Rolls Royce to illustrate its theme "on the road to success."

International Users 'Demanding'

(Continued from Page 22)

nies such as CDC often feel it is more efficient to provide their own protocols rather than having to conform to the protocol standard implemented by the packet carrier.

In another area of concern, Onstad spoke about laws being implemented by various countries to restrict the flow of data across international boundaries.

Ultimately, these regulations can affect a user's ability to freely transmit data that is "tied to an individual." DP records are included in this category, he explained.

European Treaty Pending

The Council of Europe is presently working on a treaty to cover transborder data flow and the Organization for Economic Cooperation and Development also has a study group looking into this area. The Council of Europe expects to have a draft treaty finished next year.

The European countries are also looking at the possibilities of regulating the flow of data from "legal persons," which includes corporations and other businesses.

If these trends at data restrictions continue, eventually all data could be affected, Onstad warned.

One future carrier looking at potential international implications is Satellite Business Systems (SBS), according to Ronald McCabe, manager of communications analysis with the satellite firm.

Under present regulations, an SBS customer would interconnect with an international record carrier by interfacing his earth station closest to the carrier's gateway office. This process has limitations, and SBS would like to see some changes to current regulations, McCabe said.

There is a need for high-speed circuit switched digital service. Many of the applications identified by SBS in its study of user needs require periodic transmission of bulk data. This requirement applies to international users also, McCabe explained.

Among other promising applications identified by SBS during its recent Project Prelude satellite tests are high-speed facsimile, "televisual" telecommunications and high-speed data service. SBS hopes that implementation of its service in the U.S. in 1981 will stimulate similar satellite services to be offered on an international basis, McCabe said.

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To Ease Distributed Design

DDB Standards Held Necessity, Not Nicety

By Brad Schultz
CW Staff

ANAHEIM, Calif. — Distributed data base (DDB) standards would not only be "nice" to have, they are necessary for the proliferation of DDB systems, according to the 1973 winner of the A.M. Turing Award.

Speaking here at a National Computer Conference session on DDB technology, Charles Bachman said that without standardization of DDB procedures and methodology, most DDB systems must be designed "from the ground up" as they are tailored to specific environments.

Since the long-term direction of DDB development is oriented toward worldwide pooling of data base resources — where data traffic can cut across industrial, political and geographical boundaries — DDB standardization is a global issue, he noted.

The present lack of DDB standards prevents organizations from internally developing DDB networks unless they possess substantial resources of money and expertise, Bachman said, indicating the benefits of DDB are for this reason kept not just from would-be developers, but also from would-be correspondents of those developers throughout the world.

DDB implementation does not "break up" that which was centralized, but rather integrates that which is distributed, Bachman stated. Large organizations undertake DDB development in order to create a single system that can satisfy a multitude of needs, he added.

It is not possible for any currently existing computer system to comprehensively handle the needs of any Fortune 500 company, he said. Large corporations are administered on the basis of diverse data sets that are stored and manipulated in complex ways beyond the power of present-day, general-purpose processors, he explained.

Large corporations, government agencies and other organizations are thus attracted to DDB technology, Bachman continued, suggesting that uniformity in communications procedures between nodes of a DDB network is far more important than uniformity in processing among those nodes.

Design Concerns

The two preeminent concerns in DDB design, according to Bachman, are communications between nodes of the network and the total system's ability to recover from a "crash" or other kinds of failures.

On the latter point, Bachman noted that acts of terrorism and employee strikes can cause an entire distributed network to suddenly cease functioning. He cited the case of one of Europe's largest banks, the Societe Generale, which recently experienced a strike at the primary computer facility of its network. The shutdown of that one site's computer room forced hundreds of the bank's branches to cease operating.

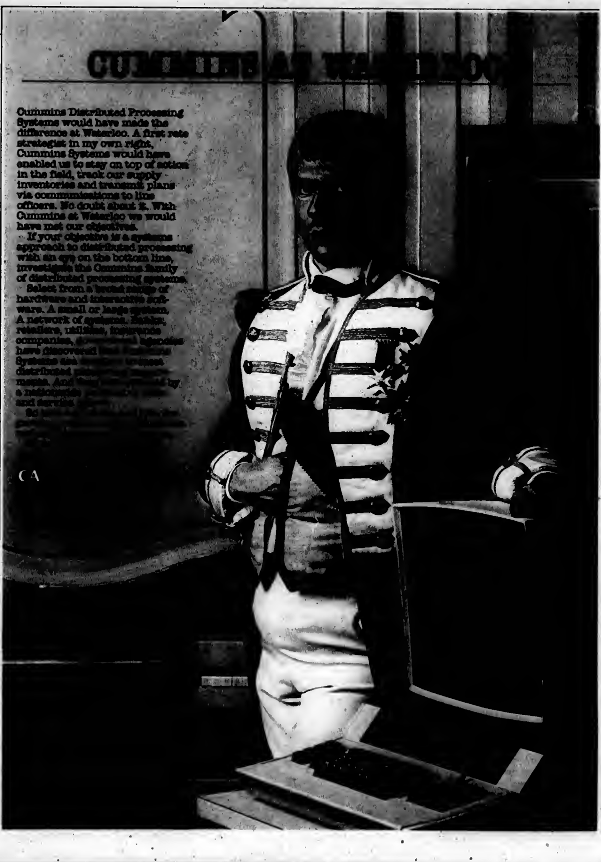
Behind the total community of people concerned with DDB technology — comprised of academics, DP technicians, public and private sector managers and legislators, among others — there is a powerful motivating force that is distinctively human, Bachman noted.

This force is based on a sense of loss and is characterized by an urge to recover local control of data, he explained, indicating that the massive centralization of data that has occurred during the past few decades has taken a toll in human anxiety.

DDB entails a reverse process in data accumulation; data germane to activities at a given location is stored and processed at that location. This characteristic can expedite local level management, but does not necessarily enhance data security — either for the local node, or for the entire network, the session's other panelists agreed.

James P. Fry of the Univer-

(Continued on Page 28)



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DDB Standards Termed Necessity, Not Nicety

(Continued from Page 27)

sity of Michigan, who has concerned himself with the privacy implications of DDB, said the general security of data in a network is independent of the extent of its detachment from central control. Data security is by definition a question of access to the resources of nodes within the network, he explained.

William H. Steiger, chairman of the Codasyl Systems Committee, which is preparing a report of DDB implications, contended the responsibility for preventing abuse of distributed data lies with those who understand DDB technology. DDB experts have a duty to educate legislators on the nature of DDB and on the ways by which distributed data can be employed to invade privacy, Steiger said.

For data to be useful, it must be interpreted in the context of the system by which it was generated, Steiger said, noting that any applications system — such as an accounting system — has its idiosyncracies and flaws.

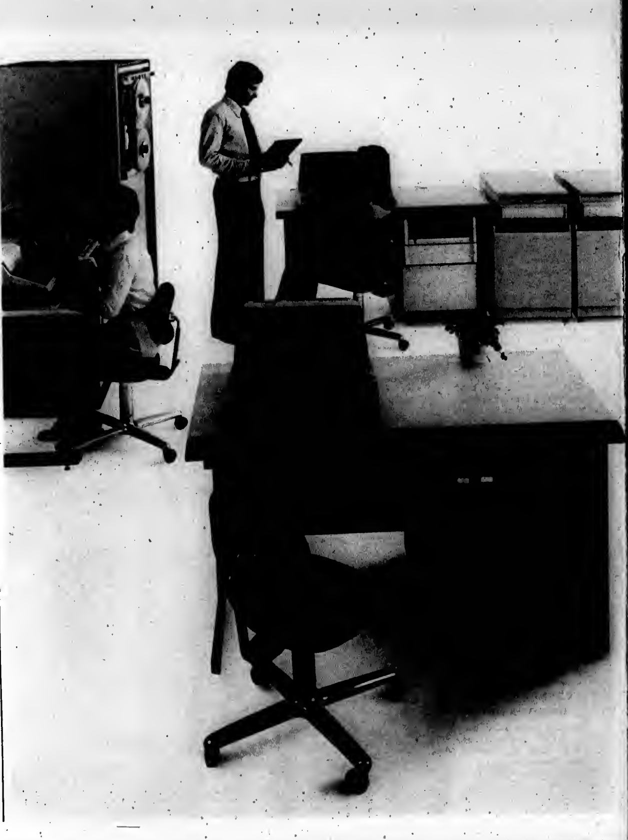
For this reason, data must be interpreted on the local level, where the system peculiarities are appreciated, rather than at some central facility far removed from where the data was produced, he added.

Although various issues connected with DDB are currently much discussed and explored, Bachman estimated that less than 1% of large automated organizations have implemented DDB and that this figure will rise only to 5% to 10% range several years from now.

Bachman attributed DDB's slow start to a scarcity of marketed software systems able to support DDB. The first type of DDB network that will be implemented on a large scale is that of "cooperating workstations," he said. In such arrangements, each workstation has the same data base management system.

The next type of DDB network to gain wide acceptance will feature "cooperating storage management" among its nodes, he predicted, explaining that each node will have sophisticated techniques for accessing data in other nodes of the network.

In the more distant future, there will be DDB networks which swap data with each other, although they will differ greatly in internal hardware and software, Bachman continued. These networks will possess powerful data conversion and translation capabilities, he added.



EEC Nations Planning Net

(Continued from Page 19)

ent data transmission and clearing functions.

The X.75 levels are "aligned" with those of the X.25 protocol to provide international end-to-end service without any inconsistencies, Amano explained.

The Level 1 physical interface specifies the use of an international digital circuit with the characteristics of synchronous full-duplex lines and transmission speeds of 64k bit/sec. Lower speeds with analog facilities are also compatible, Amano said. The international circuit can be either terrestrial or celestial.

Frame-Level Link

Level 2 of X.75, the frame-level interface, specifies the use of data link control based on the Link Access Procedure B (LAP B) as defined in X.25. It is compatible with the High-Level Data Link Control (HDLC) protocol specified by the International Standards Organization.

Each gateway switch is an international connection with equal status, so netiher a primary or secondary gateway switch is needed, he explained.

Level 3 specifies the way in which a packet is transferred, and the procedure to be applied. This level allows up to 4,095 virtual calls to be handled on each physical circuit.

This level does not cover datagrams and permanent virtual circuits; these are topics for further study by standards groups, Amano said.

Possible future needs for the other packet-switched services can be implemented within the X.75 standard because of its open-ended structure, he added.

CW Photo by A. Dooley

After four days of standing at NCC, sitting was welcome.

No Longer 'T-Shirt Industry'

Define Personal DP? Sellers Clash

By Marcia Blumenthal
CW Staff

ANAHEIM, Calif.— "A year ago the personal computer area was a T-shirt industry," Chuck Peddle, vice-president of systems for Commodore Business Machines, joked. "Now, because of less expensive technology and retail distribution, personal computer marketers can sell the consumer a cost-effective product that was not available a year ago."

Although personal computer industry representatives at the National Computer Conference here last week agreed there was a booming market for personal or consumer computers, there was less accord on exactly what a personal computer is and what applications are in store.

Lewis F. Kornfeld, president of Radio Shack, contended that the primary uses for personal computers are in small businesses and for instruction. "The personal computer," he said, "was never meant to compete with TV games or a Cuisinart."

Opposing Kornfeld's view, Dr. Albert Yu, president of Video Brain Corp., claimed that consumer computers are primarily for personal problem solving, primarily in the home. The personal computer was not meant to perform menial tasks, but rather to provide consumers with expanded problem solving capability, for tasks like personal money management or investment analysis, he said.

The personal computer, Yu stressed, is not a robot or a signal controller for turning off microwave ovens. Instead, it is a tool to aid the consumer in coping with an increasingly computerized society.

Not so, Mike Cheiky, director of research at Ohio Scientific, replied. He then insulted th average consumer by saying, "People are naturally lazy and today's personal computer is not for lazy people."

The true personal computer is a home appliance, Cheiky claimed. It should be either labor-saving or entertaining. While Cheiky conceded that the consumer computer should have some logical programming capability, he said that in order to be successful — with one in every home — the personal computer has to have voice input, voice response and remote control capability.

Unfortunately, voice input is today's limitation on developing the "lazy man's" computer, he said. However, Cheiky forecast that input technology would develop relatively quickly.

Somewhere in Between

Taking a middle road, Steven Jobs, president of Apple Computer, Inc., said the personal computers on the market today are a combination of traditional and personal computers. However, he said he does not consider the personal computer a convenience device for running bath water.

Jobs described the confusion surrounding the term personal computer by saying, "It's a consumer product that happens to be a computer or it is a computer that happens to be a consumer product."

Right now the Apple president does not consider the personal computer to be a true consumer product. The personal computer, he observed, sells solutions to problems, but the real problem is convincing consumers they have problems.

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Papers Point to Future Hardware and Software

By Howard A. Karten
CW Staff

ANAHEIM, Calif.— Several papers discussing advanced projects at last week's National Computer Conference here probably will find no immediate commercial application, but appear to have significant implications for future work in hardware and software.

Samuel P. Harbison, a graduate student in computer science at Carnegie-Mellon University (CMU), delivered a paper discussing the university's research project involving a distributed data processing (DDP) system. Harrison, who co-authored the paper with the acting head of CMU's computer science department, William A. Wulf, discussed the university's C.MMP/-Hydra project, which he said has had both notable successes and notable failures.

The project involved 16 Digital Equipment Corp. PDP-11s, 16 separate memories and a special crosspoint switch the university designed to interconnect all the units. Although Harbison never referred to DDP in the paper — preferring the term "multiprocessors" — the project nevertheless appeared to give several important lessons for future trends in distributed systems.

User Application

Begun in 1971, the project was to explore multicomputers sharing a common address space. The impetus for the research was at least partially the economics of LSI technology, which the authors believe will make multi-minicomputer structures the architecture of choice for many large-scale applications.

Other attractive features of this type of architecture are the absence of a master-slave relationship among the minicomputers linked together and the ability to fail-soft, or run with significant degradation.

Kernel Environment

Another significant feature of the project — although actually a separate aspect of the work — was the Hydra operating system. According to Harbison, Hydra is a "barebones" operating system devoid of files, a command structure and even a file scheduler.

The intention was to allow Hydra to be a "kernel" or basic environment which allows users to supply the more familiar functions of an operating system.

Notable accomplishments of the project, according to Harbison, include the construction of a cost-effective, symmetric multiprocessor, the symmetric distribution of the Hydra kernel over all processors and a successful mechanism for the detection of and recovery from software and hardware errors.

An additional, important finding was the reliability of the crosspoint switch, which had initially been the subject of considerable doubt by the academic computing community.

Discussing what he saw as the failures of the project; Harbison drew applause for his statement that the 16-bit architecture proved too small for several purposes. Additional disappointments of the project were a smaller degree of hardware reliability than the research team would have liked and the problems of memory contention when using high-performance I/O devices.

Virtual Design: 'No Problems'

Another participant in the session, W.D. Strecker of DEC, discussed his work on VAX-11/780, a virtual address extension to the DEC PDP-11 family. Commenting that the design of a large virtual address minicomputer presents "no great problems," Strecker told the audience the real challenge lies in the areas of compatibility and simplicity.

Compatibility is important in preserving the investment of both end user and vendor in equipment, he said, while simplicity preserves the features that make minicomputers attractive in the first place.

Discussing the design criteria of the virtual operating system, Strecker said compatibility with the PDP-11 was a strong goal, but the designers felt an over-emphasis on absolute compatibility would limit the success of the project. Therefore, it was decided to include two modes of operation for the system: native mode, to make full use of the virtual facilities, and compatibility mode, to be able to run existing PDP-11 programs under control of the virtual operating system.

CW Photo by A. Dooley

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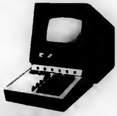

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Couger: 'Almost Unbelievable'

DPers' Need for Socialization Found Very Low

By E. Drake Lundell Jr.
CW Staff

ANAHEIM, Calif. — Computer professionals have a strong need to grow within their profession, but their need for socialization is "so low as to be almost unbelievable," Dr. J. Daniel Couger told a session at the National Computer Conference here last week.

Couger, a computer scientist from the University of Colorado, added, however, that a job redesign for computer professionals could raise the present low levels of satisfaction among DP workers and increase productivity.

Reporting on a study of DP professionals — programmers, programmer/-analysts and systems analysts — in 25 organizations, Couger said that at present the job satisfaction level is fairly high overall among such workers. But, he added, the "signs of job dissatisfaction are growing in the computer field."

In the past and even to some extent at present, people are attracted to the field because it is exciting, he said. However, this is not enough to keep them in the business.

In order to discover how better to motivate people in DP, the study undertaken by Couger was aimed at finding whether DPers are similar to other workers — if they can be motivated in the same ways — or whether they are different and need different handling.

To find the overall satisfaction level, the survey questioned the DPers on their relative happiness with five core job areas — skill variety, task identity, task significance, task autonomy and feedback.

Overall, DPers at the analyst level rated their profession slightly better in these areas than did other professional workers, Couger noted, while programmers rated their satisfaction slightly lower than other professionals. However, the variations were so slight, they were not really statistically meaningful, he added.

For example, on a scale up to 7, systems analysts rated their profession at 5.73 in the skill variety area and programmers rated theirs at 5.16; the overall average for other professionals on the same standardized tests was 5.36.

Overall, DPers said they are generally satisfied, when directly asked whether they like their jobs; systems analysts rated them at 5.19 and programmers at 5.17, while other professionals rated them only 4.88.

Real Difference

But while there are some variations in these areas between the DPers and other professional workers, the real difference comes in the area of socialization and ability to socialize, Couger said.

On the standardized tests, on the same scale of 7, DPers rated 3.7 in this category while other professionals rated 5.65, Couger said, adding that never in the history of this testing has there ever been such a large variation from the norm.

This proves computer people are in fact different, Couger said, and have to be motivated in different ways than other professional workers in an organization.

The low showing in the social needs category, he said, was slightly offset by a high need for growth. Personnel should probably be motivated on this basis, he indicated.

One area in which there could be improvement was immediately visible from the study, Couger said, and this came in the area of feedback.

DPers as a group rated the feedback they received from management lower than did any other professional groups; they also rated the level of supervision they received lower than others, he said.

Since they show the highest ratings in needing challenge and growth within their job categories, better feedback could help them become more motivated and therefore more productive, he said.

At the same time, DPers seem to want to have projects that are larger in scope than do other professionals, he noted, adding the others seem to prefer more specialization in their tasks than do DPers.

Panelist Mayford Roark agreed on this point, noting that excessive job fragmentation may make programmers feel they have little responsibility for the finished product and therefore decrease their motivation.

Roark, who is DP manager for Ford Motor Co., also agreed about the ability of supervisors in the computer field. In an internal study, Ford found only one-third of the DP workers felt that they were getting good leadership from systems personnel who had moved into supervisory positions.

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To Simulate Energy Variables

Utilities Using Modeling for Market Strategies

By Marcia Blumenthal
CW Staff

ANAHEIM, Calif. — Utility companies are turning to computer modeling to help evaluate energy considerations affecting the marketing of their product, and several speakers at last week's National Computer Conference here described how they work.

According to Dr. Allen C. Miller of Applied Decision Analysis, Inc., Michigan Consolidated Gas Co. used a Model from Miller's consulting firm to help determine what share of the market it could expect in the future based on information that natural gas prices would rise.

The Michigan utility was particularly concerned because if prices rose too much, several of their key customers — Ford Motor Co. and General Motors, for example — might switch fuels, severely impacting the gas company's market share.

Crux of Problem

The crux of the problem was finding the point at which various types of natural gas consumers would change to another type of fuel, Miller explained. Some of the "uncertainties," or variables, fed into the model included the availability or lack of gas at future dates; lags in consumer response to availability and price; consumer decision criteria; constraints on switching to various types of fuel; and conservation and regulation.

Another crucial factor the model examined was the gas customer's tendency to convert to multiple-fuel burning methods. In other words, Miller asked, when a consumer updated fuel-burning techniques, how sensitive would availability and other factors be in a decision to incorporate oil-burning capability with present gas-burning capability?

The model forecast switching behavior over a 20-year period using a dozen fuel types and a dynamic programming mode (moving backward from a prearranged result).

Surprisingly, Miller said, the model predicted that if natural gas prices exceeded oil prices even by a modest amount, large users would begin to make capital outlays to install dual- or triple-fuel burning capability in spite of the fact that this behavior would not be economically feasible at those particular increased price levels.

Availability seemed to be the motive overriding capital outlay considerations. "People want to make sure they will have the capability to have fuel if there is a shortage," Miller said.

The implication was the the Michigan utility would probably not lose business in the near future if prices rose, but because customers would be moving toward multifuel burning capability, they could switch quickly. This sudden switch would have a devastating effect on the company's market share, Miller noted.

As a result of the modeling exercise, the company has gone before the Michigan Utility Rate Commission to change its rate structure in order to make it more competitive.

Electric Peak Model

Using the computer-assisted modeling technique for a similar application, Dr. Philip F. Schweizer, an engineer with the Research and Development Center of Westinghouse Electric Corp., developed a market forecasting model for regional electric peak load growth. He noted this was the first time the center developed a model to serve as a market research tool.

The model simulated electricity usage by residential, commercial and industrial end-user sectors for nine regions of the country. Its goal was to forecast maximum electric peak load growth for each region.

This would provide Westinghouse with a strategic planning tool for managing peak load growth, a means of determining what kind of equipment it would have to use and a way to forecast the amount of capital outlay to be made, Schweizer said. Westinghouse considered the information generated by this model exceedingly important because a 1% change in the annual growth rate translated to an annual change of $8 billion in revenues.

Using the model, Westinghouse discovered that the total annual U.S. peakload growth was approximately 7.2%, just slightly over the 7.1% growth for total energy usage.

Schweizer commented that a major contribution of the model was the ability to isolate casual variables that were driving peak load growth in each region.

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Solution of Energy Problem Held 'Critically Dependent' On DP by DOE Official

By Edith Holmes
CW Staff

ANAHEIM, Calif. – "The resolution of our energy problems is crucially dependent on computing," Dr. Joel A. Snow, associate director for research policy at the U.S. Department of Energy (DOE), said here last week.

Addressing the plenary session of the 1978 National Computer Conference, Snow suggested that in the short term the U.S. will need computerized energy models to help manage the nation's and the world's diminishing fossil fuels and to locate dwindling oil and gas reserves.

In the "intermediate" term, defined as the 1990s, computers will be needed to explore the problems associated with technologies close to commercialization, such as coal gasification, magnetic fusion and enhanced oil recovery, the DOE official stated.

Learning to predict the impact of the release of carbon dioxide into the atmosphere when fossil fuels are burned will challenge our long-term computational abilities, Snow added.

Predicting that by the mid-1980s the world demand for oil will exceed the Organization of Petroleum Exporting Countries' (Opec) ability to deliver and that the world's production of "liquid gold" will reach its peak just after the year 2000, Snow said DOE believes the U.S. and the world must shift from petroleum to solar energy, nuclear reactors, nuclear fusion or a combination of these in the next, all-too-few years.

"We must make an historical transition from petroleum to 'X' or 'X plus Y plus Z' or to some nonlinear combination of energy sources," Snow stressed. "And if that combination is nonlinear, we will certainly need computers."

Fifty Big Machines

Housing in 38 major research installations approximately one-quarter of all the computers the federal government owns and leases and spending $230 million in fiscal year 1977 on them, DOE considers computing one means to the creation of a versatile array of energy technologies, Snow said.

Fifty of the Energy Department's more than 2,000 systems are large-scale, scientific machines. The size of a Control Data Corp. 7600 and larger, these CPUs are used to provide the government with three-dimensional simulations of the distribution of pollutants in the atmosphere and to track and unravel complex chemical processes, the DOE official explained.

As the complexity of our energy problems increases, the demand for improvements in the performance of the CPUs will intensify, he predicted.

Another group of mainframes is used for socioeconomic modeling at several national laboratories, Snow said.

These applications demand processors with large memories and will eventually serve the country best when they are part of distributed networks.

For this kind of modeling, improvements in data communications are at least as important as increases in raw computing power, he stated.

Business DP, office automation and personal computing for technical professionals round out the DOE's computer requirements, Snow said. More than two-thirds of the approximately 2,000 minicomputers belonging to the Energy Department are used by individual scientists and engineers with terminal hookups to what then becomes their own personal CPU, he explained.

None of these figures include the DOE's more than 1,000 outside contractors, who each have their own computing power, Snow added.

The future will demand the big computer for such purposes as discerning the chemical effects of coal gasification or the behavior of pollutants in the atmosphere, according to the DOE official. Smaller machines will be called upon to perform humbler tasks, including the sizing of solar collectors for individual homes and the monitoring of automated furnaces, Snow said.

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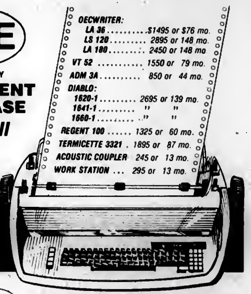

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Personal DP Making 'Now' Exciting: Isaacson

By Denise Petski
CW Staff

ANAHEIM, Calif. — "No time is more exciting than now, for now is personal computing," Portia Isaacson, computer store owner and a fellow with Electronic Data Systems, said at the National Computer Conference here last week.

The number of computer hobby clubs has grown considerably in the past few years to more than 400, she said, attributing the growth to the increasing number of resources available to the computer hobbyist.

Many hardware options are available to the hobbyist today, including terminals, voice synthesis and graphics, she said. There are also 10 or 12 personal computing magazines available to bring the hobbyist the latest available information, she added.

Describing the present competition between Radio Shack and IBM in the personal computing arena as "guerrilla warfare," Isaacson said the heart of personal computing is the retail computer store.

The retail store is essential in bringing products to the public. It offers demonstration systems for testing, sells books and magazines, services, equipment and can write computer maintenance contracts. The retail store also has software for sale and offers information and educational classes to the public. One of the best features of the retail store, according to Isaacson, is that it tries to keep the inventory on the floor, therefore avoiding several-year waits.

But stores, too, are growing and changing, she noted, and several different kinds of retail computer stores will develop to meet the demand for computer power that goes beyond hobbyists to small business and industrial process control applications.

Only about 20% of the personal computing market is made up of hobbyists, she said. Process control, education and business applications must also be included in what is considered to be the personal computing market.

Isaacson also addressed the size and cost of these computers, saying the personal computer need not be extremely small in size and a small business computer can be run on $5 a day, which is economically justifiable.

Isaacson also noted that there should not be much of a decrease in hardware costs over the next few years, but there should be enormously increased capabilities. Predicting that every home will have several computers, Isaacson noted that virtually everyone at some time will know how to program a computer. Computers in the home will be used mainly for entertainment and education. Children will someday be tutored by computer and their parents will be able to simulate stock market activities.

The future of the economy will also be affected by the personal computing industry. Since most personal computers cost less than $10,000 and are very easy to use, some jobs in the DP center may be eliminated. The "automated office" will also eliminate the secretarial function, she added.

Computer education will also be very common. With virtually everyone knowing how to program, entry-level programmers may be in oversupply. The entire country will be computer-literate, according to Isaacson.

Low-cost computers will have an effect on small businesses, leaving little demand for clerical help. According to Isaacson, labor organizations are already fighting against the automated office.

Negative Aspects

There are also some negative aspects to the personal computing phenomenon, Isaacson said. For example, any device can be used for data collection in a surveillance or criminal operation. According to Isaacson, theives have been known to use personal computers as inventory control devices for stolen materials.

On the other hand, personal computing will have many positive effects. Scientists will no longer be tied to university computers, they will use their own. There will also be advantages for the handicapped and in the entertainment and educational fields.

Panel chairman Jim C. Warren, editorial adviser for *Dr. Dobbs' Journal of Computer Calisthenics and Orthodontia*, cited several projects currently under way that will make the difference between fact and fantasy in personal computing.

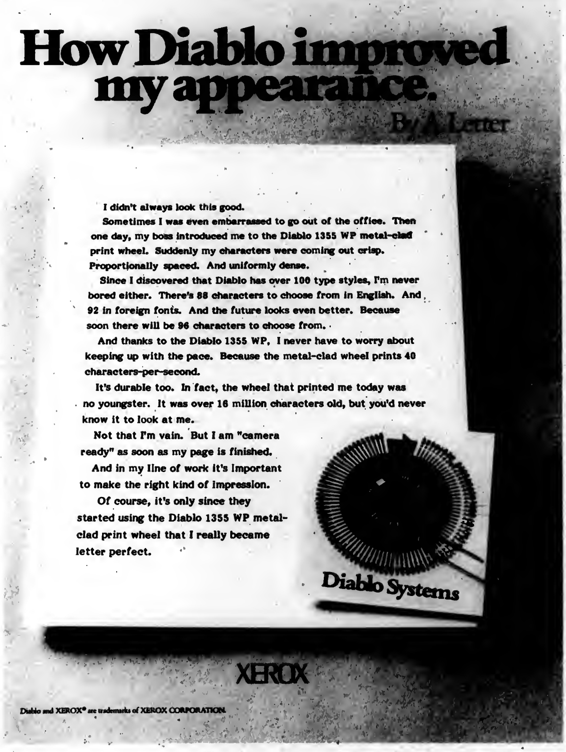
One is his digicasting project, which transmits digitally encoded information on an FM radio subcarrier. This service will transmit local and regional newswires, he said.

Panelist Dan Engels, a member of Xerox Corp.'s Palo Alto Research Center, and Ted Nelson, a DP consultant, also discussed projects which would turn fantasy into fact in the area of personal computing.

Dan Engels, who is in charge of the Small Talk Operation at Xerox, said he is disappointed in the way people are shackled with history. There is nothing small about the home computer, he said, and there is a need for the best in software in home computing.

Nelson predicted there will be 10,000 home computers within the next 1-1/2 years. If the production isn't available, the demand will still be there.

All panelists agreed that home and hobby computing is the way of the future. In Isaacsons's words, "We are incredibly lucky to be present at the dawn of personal computing. May the force be with you."



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Software, Documentation Hurting Personal DP

By Tim Scannell
CW Staff

ANAHEIM, Calif. — Poor software and incomplete documentation are the two major handicaps existing today in personal computing, a panel of speakers at the National Computer Conference agreed here last week.

Software documentation, as it is presented to the average user, is confusing because it usually lacks the necessary specifics, Jeff Raskin of Apple Computer, Inc. stated. These specifics, left out by various manufacturers, consist of everything from descriptions of listed code to instructions to the user on how to turn on the microcomputer.

Manufacturers routinely sell software that isn't free from program "bugs" or, in several cases, doesn't work at all, Baskin said. Because of this lack of quality, the software aspect of the industry is sometimes regarded as the "seamy underside of computers," he said.

Vendors have sacrificed the clarity and readability of microcomputing programs to attain additional memory space and faster execution speeds, Raskin continued. As a result, people are "turned off" to personal computers in general.

Competent Writers Absent

The bulk of the software problem lies in the fact that the vendors fail to use competent documentation writers. Languages have become more and more simplified as the industry has grown, and manufacturers have mistakingly done away with "literate" software writers in favor of people who fail to successfully convey the essence of computer programs, Raskin contended.

There are three ways to effectively write software documentation, according to Raskin. The first is to test the programs using "nonprogramming" people. A user shouldn't need any previous training to run a successfully written program, Raskin pointed out.

Second, the programs should be tested by people who are very critical, such as other programmers.

Finally, the programs should be tested by the documentation writer himself. The "old way" to document programs was for the writer to "add a few head notes to the program and send it off to a typist." Writers should take the time to sit down with the software, run the program and write down everything that is done, step-by-step, Raskin said.

This practice is basically a simple one, but unfortunately "almost never done," he added.

The reason for this, Raskin explained, is that "management, in general, doesn't know how to manage documentation efforts." Management doesn't realize that without well documented software, the manufacturers "won't have products going out to the celebrated consumer in the street at all."

Difficult Job

Louis Frenzel, representing the Heath Co., agreed with Raskin on the poor state of microcomputing software but noted the manufacturers have a difficult job because they have to implement the things that hobbyists "dream up."

The microcomputing industry has matured, Frenzel said, but it is dominated by fairly small companies that do not have the financial stability to improve faulty software.

The microcomputing industry, Frenzel continued, has broken down into four different groups: the hobbyists, small businesses, education and the consumer appliance market.

Hobbyists are composed of a "mixed bag" of individuals, Frenzel said, "many of whose interest is sustained by building equipment and adding on to their systems." These "hardware jocks" are more interested in the size and capabilities of their equipment and, as a result, software is considered secondary in nature.

Subsequently, Frenzel continued, a huge used equipment market is developing because hobbyists want to own better machines.

Best Potential Market

The small business market is considered by the manufacturers to have the greatest potential "dollarwise," Frenzel said. This type of user is even "less knowledgeable" than microcomputing beginners and considerably more naive, limiting his interest in microcomputing to "knowing he needs a computer and realizing he can't afford it," Frenzel explained.

"Some of these users aren't even aware of the necessity of software," he noted.

Computer stores are in the best position to act as an interface between the small business user and the microcomputer manufacturer because the stores can supply the local support that the user needs, he added.

In the area of education, microcomputers are basically used as an extension of the audiovisual department or as a "disperser of material."

Computer-aided instruction (CAI), although practiced by a few colleges and even fewer high schools, is still in its infancy, Frenzel stated, and has a considerable way to go before it is accepted as a normal part of the curriculum.

The belief that personal computers will be successful on the consumer level is simply "a lot of baloney," Frenzel declared. It is "ridiculous in every way to believe that homes will someday have a computer."

Consumers Not Ready

The average consumer isn't ready for the implementation of a home computer, Frenzel said, let alone ready to bother with computer programs and system trouble shooting.

Manufacturers would have to supply software that is geared toward teaching the consumer how to run the machine, Frenzel stated.

The current trend is for "all-in-the-box" technology in microcomputer design and the software and related documentation will have to follow suit if personal computer manufacturers want to win consumer acceptance.

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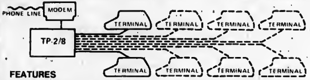

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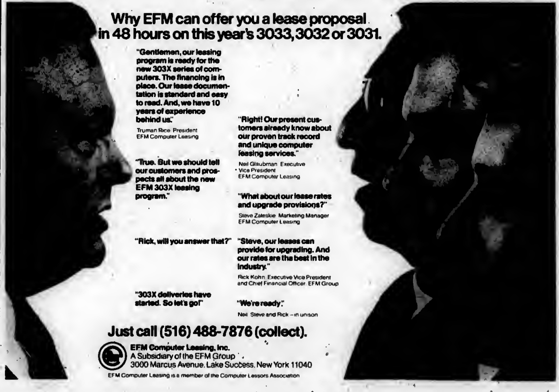
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Mismanagement of Time Blamed on Work Habits Rather Than Other Factors

By Nancy French
CW Staff

ANAHEIM, Calif. — People tend to blame outside factors and other people for wasted time instead of examining their own work habits to see where the real blame lies, James F. Towsen of Towsen and Associates told a packed room at the National Computer Conference here last week.

Towsen, who credited Alex McKinsey, author of *The Time Trap*, for the ideas presented in his session, described the solution to the time problem as "identifying the activities that waste your time and then controlling them."

Towsen suggested DPers monitor their activities by writing down everything they do for three or four weeks, then analyzing those activities to see what can be eliminated, delegated or handled more effectively.

Towsen focused on 15 key problem areas, of which ineffective delegation of authority was one. "Perhaps you really are trying to do too much yourself," he told the session attendees. "Assign certain jobs to other people and them make sure they have the authority they need to carry them out.

"Perhaps your desk is so cluttered you waste time trying to find the papers you need. If it's Friday and Monday's work is piled on top of Tuesday's work and both are covering Friday's work, you are not going to be very efficient," Towsen said.

Sometimes people spend too much time "putting out fires" and "managing crises." This sort of activity is born out of poor communication, meetings without objectives, tasks left unfinished and simple personal disorganization, he said.

Towsen suggested planning very few meetings; when meetings are scheduled, there should be an announced agenda and only the necessary people should be invited to attend. Minutes of the meeting should be sent out within three days to every person who participated and others whose responsibilities will be affected by the meeting.

If the time management problem stems from inaccurate or delayed information, one person within an organization who has good communication skills should be made responsible for writing all procedures, instructions and memoranda. These should be kept brief, Towsen said, especially memos.

Cut out everything but "the meat" and put that information "right in the first paragraph so it hits your readers right between the eyes," he urged, adding memos be limited to one page.

Another suggestion Towsen made was to limit computer-generated reports because "management can't possibly digest all that stuff." Instead, the Harrisburg, Pa., consultant urged attendees to report by exception. Data processing can be especially helpful in finding those exceptions, he indicated.

In the area of mail, Towsen urged his audience to handle it once wherever possible. Make decisions on it quickly — either pass it on, act on it or "use the wastebasket," he said, calling the wastebasket and the dictating machine the two "most valuable tools" in the office.

Procrastination and indecision were also identified by Towsen as common time wasters. "If you have the authority, make the decision," he said. There's no need for most decisions to take more than about three days.

Finally, Towsen told attendees to "learn to say 'No' and then say it." In addition, he recommended cutting down on chit-chat during phone conversations and coming directly to the point with a caller.

If necessary, he added, lie to get off the phone: "Say the home office or your boss is calling and suggest that your caller call again later. Most of the time he won't," Towsen said, which clearly indicates how unimportant the call really was.

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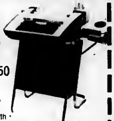

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County Clerk Sued

Entry Error Provokes False Arrest

By Marguerite Zientara
CW Staff

PALM BEACH, Fla. — A Palm Beach welder is seeking damages "in excess of $2,500" in the case of a computer-related error that provoked his unwarranted arrest and near-incarceration.

Lawrence Leeb claimed in a recently filed civil suit that County Clerk John Dunkle's IBM 370/138 erroneously reported that he failed to pay $500 in court costs stemming from a marijuana case. Leeb paid the $500 fee in May 1976 under the name "Larry Leeb," and the payment was duly recorded in the computer.

However, on Jan. 11, 1977, a sheriff's deputy arrested Leeb while he was on the job, "in front of his coworkers and employer," handcuffed him and took him to the county jail for nonpayment of the $500.

Attorney Nelson Bailey, who represented Leeb in the marijuana case, said Leeb was in the process of being booked into the county jail when a deputy clerk, confronted by Bailey's insistence that Leeb had paid the fine, searched for and found a copy of the cash receipt. A judge then cancelled the arrest.

According to Jim Groth, Palm Beach County DP manager, the problem was one of data entry. "The computer did not recognize that Larry Leeb was also Lawrence Leeb." The computer, according to Groth, is used to store criminal information on misdemeanors, traffic violations and felonies.

The suit, filed May 11 on Leeb's behalf by attorney Thomas Hoadley, stated: "Defendant's computer at all times . . . was an agent or employee of defendant [Dunkle] and had a duty to act faithfully in the performance of its duties and employment . . . Defendant's computer did not, in fact act faithfully and was, in fact, negligent because said computer advised the clerk's office . . . Larry Leeb had not paid the court costs of $500."

The suit claimed Leeb deserved damages because he "had to spend money to correct this error, to free himself from the Palm Beach County Jail, and therefore there has been an improper infringement upon . . , Larry Leeb's peace of mind, reputation, his job, his finances and most important, his liberty."

No date has been set for a hearing.

NBS/ACM Slate Meet Keynoter

WASHINGTON, D.C. — White House staff member Richard M. Harden will deliver the keynote address at the symposium on "Tools for Improved Computing in the '80s," to be held at the National Bureau of Standards (NBS), Gaithersburg, Md., on June 15.

Harden will speak on "Sharing Information for Decision Making in the Federal Government." He is a special assistant to the President for information management and director of the Office of Administration in the Executive Office of the President.

The symposium is the 17th annual technical meeting of the Association for Computing Machinery (ACM) Washington, D.C., chapter and the NBS Institute for Computer Sciences and Technology. It will include sessions on "supercomputers," software engineering, programming languages, microprocessor software, status of the President's DP reorganization project, hardware architectures, management issues, software tools, and optimization tools.

For additional details, contact Stan Lichtenstein at 301-921-3181.

Calendar

July 28, Toronto — **Paper/Printer Industry Conference**, sponsored by Dataquest, Inc. Contact: Ronald I. Miller, Dataquest, 3000 Sand Hill Road, Menlo Park, Calif. 94025.

July 30-Aug. 2, Hershey, Pa. — **OCR: A Matured Technology and Its Impact on Future Applications**, sponsored by Optical Character Recognition Users Association (OCRUA). Contact: OCRUA, 10 Banta Place, Hackensack, N.J. 07601.

July 31-Aug. 11, Santa Cruz, Calif. — **Computer Graphics**, sponsored by University of California Extension. Contact: Joleen Kelsey, University of California Extension, Santa Cruz, Calif. 95064.

July 26-28, New York — **Marketing Through Industrial Distributors**, sponsored by American Management Associations. Contact: American Management Associations, 135 W. 50th St., New York, N.Y. 10020.

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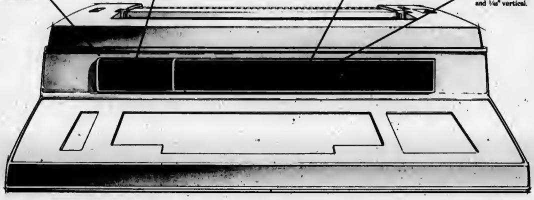

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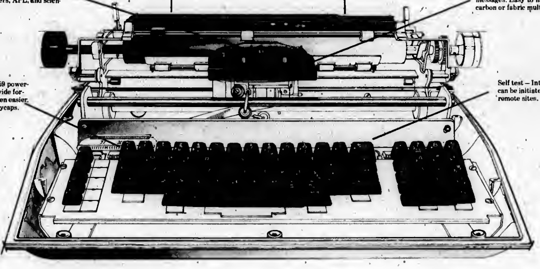

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Program Error Causes Faulty Federal Payments

By Ann Dooley
CW Staff

HOUSTON — A programming mistake caused numerous payment errors in checks issued to individuals who participated in federally financed manpower programs here, underpaying some and overpaying others.

The individuals involved were receiving unemployment insurance and Aid to Families With Dependent Children (AFDC) and were thus eligible for the special programs.

The payment errors occurred in 1975 and 1976. They were discovered by the end of fiscal year 1976, but no attempt has been made to determine the correct payments for those affected since "it is next to impossible to figure out the back payments for each welfare recipient," according to Richard Flores, the Labor Department's associate regional administrator here.

It has been projected, however, that an estimated $1.05 million in pay was withheld for the fiscal years of 1975 and 1976. The same programming error caused overpayments during that same period to workers in the Comprehensive Employment and Training Act (CETA) program totaling an estimated $257,000.

Switch to Service

The mistakes occurred during a changeover in 1975 from an in-house processing system to a service bureau, Houston Ceta Director John Brown said.

The city programmers who prepared the software for use by the service bureau failed to program the system to update changes in activity or status for those in the Ceta program, he explained.

The system should have altered the pay of Ceta beneficiaries when they changed jobs or classes, Flores said. The programming was never reviewed and therefore the error was not caught until a routine check.

Once the error was discovered, it was corrected immediately, Flores said, adding no attempt was made to determine who was responsible for the oversight in programming.

Total allocations for those years were $18.7 million for programs that involved 17,398 persons in the city of Houston.

Although it is not known how many people received incorrect payments, it is known that those affected were receiving vocational training and many were welfare mothers, according to Flores.

A sample audit was made to examine four payrolls out of 20 in fiscal year 1975 and 11 out of 32 payrolls in fiscal year 1976. These payroll figures projected the estimated over- and underpayments and are all there is to go by, officials said.

The dollar figures are somewhat misleading, however, according to Flores, who explained that anyone receiving AFDC or unemployment funds who was enrolled in a Ceta program also received a small allowance as an incentive for being in the program.

Problems arose when a person moved into an activity which called for payment of a wage. The system was programmed to ignore the status change and so continued paying the allowance instead of the hourly wage.

In this sense, each recipient was underpaid, Flores said, but once a person earned a wage, his AFDC or unemployment payments would have been reduced or dropped, he noted. Since the recipient's welfare check was not reduced, he was not being shortchanged as much as was thought at first, Flores claimed.

Although the error was discovered and corrected soon after fiscal year 1976 ended, the error was not generally known until the Department of Labor made an overall investigation of Houston's Ceta program. The investigation was spurred by various other problems in the city-run program as well as a poor performance record, officials said.

The actual net dollar affect of the mistake was minimal, according to Brown.

The people affected by the programming error were not officially notified at the time about the mispayments, but even after the mistake was made public, there were no complaints or requests for repayment by those directly involved, he claimed.

Dartmouth Faculty OKs Master's in DP

HANOVER, N.H. — A proposed program for a master's degree in computer and information science was approved by the faculty of arts and sciences at Dartmouth College here recently. The proposal will go before the board of trustees of Dartmouth at its meeting here this month.

The master's program start would be contingent upon raising of funds external to the regular academic budget to cover the costs of the program.

The focus of the master's program would be on the design, implementation and management of complex information systems and on the social issues surrounding their use. The program would come within the faculty of arts and sciences and would be coordinated with the department of mathematics and the Kiewit Computation Center at Dartmouth.

The faculty vote authorized the master of science program for five years and stipulated that it be reviewed, both academically and financially, in its fourth year.

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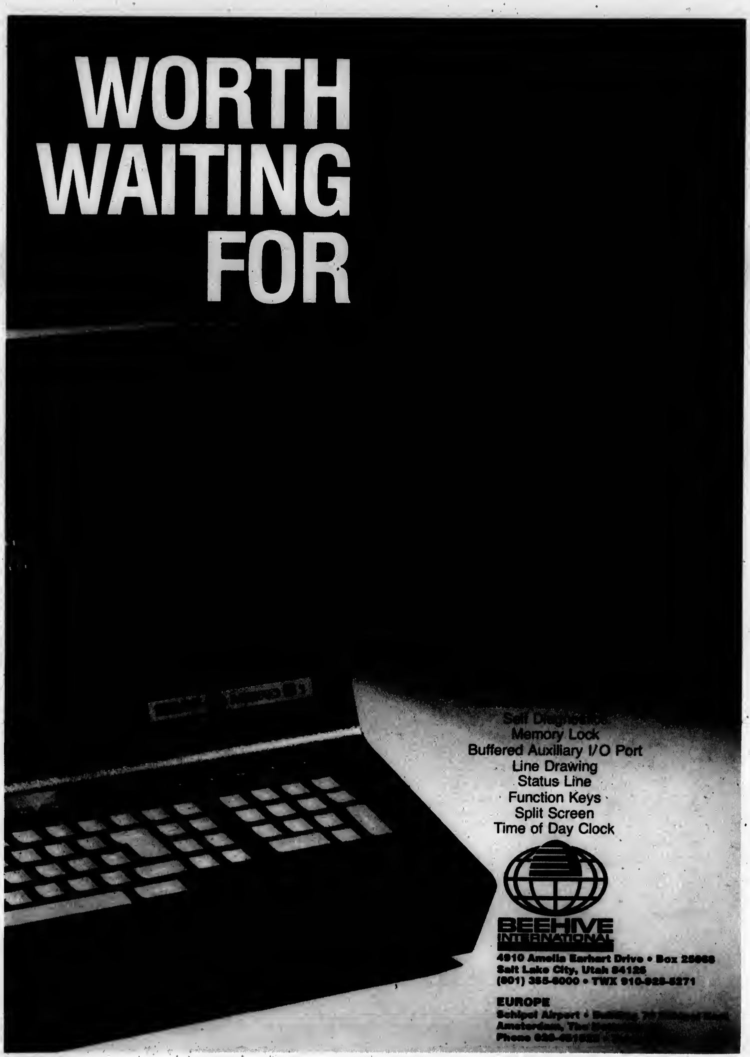

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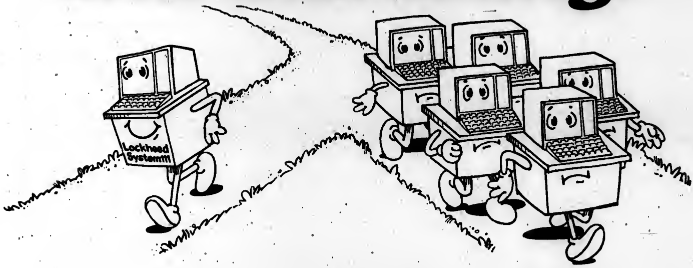
The contrary theory of business computer design and marketing.



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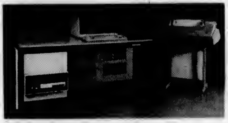

Lockheed System III

But Local Operational Control

Central Rules Urged for Dispersed Data Bases

By Brad Schultz
CW Staff

WOBURN, Mass. — An organization should not distribute its data bases unless its central management implements powerful guiding procedures to support this effort, a recent Computer Expo 78 workshop audience was told here.

Moreover, data bases should not be distributed unless data access requirements are also distributed or unless appropriate expertise and resources are available to support their implementation, according to Don R. St. Clair, a senior consultant with the Chicago accounting firm of Deloitte Haskins & Sells.

St. Clair, a specialist in data base management and data integrity and security, said the best approach to distributed data base administration is local operational control with central procedural control.

Powerful guidelines from central management should be adopted by the entire organization, St. Clair told the gathering of DP users. Otherwise, he explained, member installations will probably become incompatible in a distributed data base environment.

Data base access requirements should be distributed along with the data bases so the extent of security violations can be minimized, he continued, pointing out that unless security requirements are localized, a breach at one site could mean infiltration of the network's other data bases.

Further, an organization attempting data base distribution should understand the scope of such an undertaking and be prepared to furnish the expertise and resources demanded by such an effort, St. Clair said.

Three Control Options

Distributed data base administration can be approached via local control, central control or the local operational control/central procedural control mix, St. Clair said.

The chief risk of local control is incompatibility between member installations; central control risks becoming, in a sense, too bureaucratic, he indicated.

With central control, it is possible for central management to order a completely inappropriate operating system for a member installation. The member facility may have implemented certain applications software which could crash the assigned system, resulting in a significant loss of money and resources for the entire network.

In such a case, central management would be acting in ignorance of developments at the local level within the network, he said. In the case of incompatibility among network members, at least one member would act in ignorance of developments at the central level.

Local operational control with central procedural control yields the best of both situations, St. Clair maintained. Local operational control confines security problems, he said, while central procedural control ensures harmony throughout the network.

Benefits, Disadvantages

The main benefits of distributed data bases include satisfaction of local system requirements, enhancement of overall reliability and security through containment of local problems, modularity in growth and a reduction in communications transacted, St. Clair said.

Drawbacks include a limitation of commercial software available to the user, a large commitment of resources and an increased demand for "strong administrative methods and procedures," he said.

Call for Papers

1979 NATIONAL COMPUTER CONVENTION, New York City, June 4-7, 1979

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Send six copies of a short (2,000 word) or long (5,000-word) paper with six copies of a title page containing a 150-word abstract, four to six keywords, affiliation, address and telephone number to Dr. Richard E. Merwin, Box 32222, Washington, D.C. 20007 by Nov. 1.

1978 COMPUTER NETWORKING SYMPOSIUM, Gaithersburg, Md., Dec. 13, 1978

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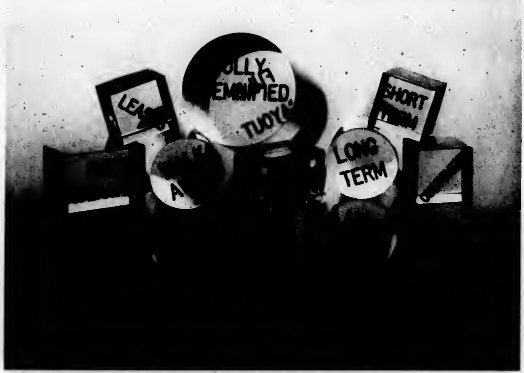

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Aboard Orbiting Observatory

Parallel Processor Pointing to X-Rays in Space

BLOOMINGTON, Minn. — A four-pound orbiting computer is aiding a scientific search for X-ray emissions from the planet earth and extragalactic sources.

The computer is the Control Data Corp. Model 469 R², which is used in on-board spacecraft control. The system, which measures four inches by five inches, was designed and built by CDC's Digital Image Systems group here and is part of the High Energy Astronomy Observatory (HEAO) project which began last year.

HEAO is studying cosmic rays, gamma rays, and X-ray sources in deep space, with a concentration on neutron stars, pulsars and the mysterious "black holes." The black holes are believed by scientists to be the remnants of collapsed stars so dense that light cannot escape them.

The Model 469 R² is a 16-bit parallel processor with two 8K-byte plated wire memories. The computer is controlled through an IBM 360/65 on the ground at the National Aeronautics and Space Administration (Nasa) Goddard Space Flight Center near Washington, D.C.

TRW, Inc. designers of the spacecraft used in the HEAO project, programmed the computer through a subcontract from CDC.

Scientists at Goddard loaded the memory on the computer aboard the spacecraft. The computer is programmed to determine the direction in which the spacecraft is drifting so it can tell scientists which way to point the craft to study selected objects in the sky.

Two of the CDC computers are aboard the spacecraft, one serving as a backup to the primary system.

Two Stars Discovered

The computer has thus far helped the observatory to discover two stars far from the earth that are exchanging clouds of gas so hot that they are 10,000 times stronger than all the combined radiation from the sun.

Because the observatories are located in space, a long-term study is possible, freeing the scientist from haze and atmospheric disturbances that disrupt his vision when the study is attempted from earth.

The HEAO project will also attempt an analysis of quasars, which scientists believe to be the most remote of visible objects in the universe. If the distance is as great as many scientists believe, the total amount of energy emitted by a quasar in one second would supply all the earth's electrical energy needs for a billion years.

Scientists hope the study will provide a better understanding of the processes in which X-rays are emitted in space.

Two more orbiting laboratories are scheduled to be launched during the next two years.

Hatch Elected By Insyte Users

DALLAS — Dick Hatch of Sterling Computers in Houston was elected president and chairman of the board of Insyte Users Group, Inc. at the recent fourth annual Insyte Datacom Users Conference here.

Insyte Datacom Corp. is a Dallas-based international vendor of proprietary data base, data communications and related data management systems software.

Other officers elected, also with Sterling Computers, included Chip Hull, vice-president; Cindy Pursley, secretary and treasurer; and L.S. Bayer, board member.

Regional coordinators elected were Bob Blum of Ore-Ida Foods, Boise, Idaho (West); Al Malioriello of United Stationers Supply, Forest Park, Ill. (Central); and Doug Kanz of Empire Detroit Steel, Mansfield, Ohio (East).

Brochure Describes Contract Services

NEW YORK — A brochure entitled "Computer Contract Negotiation and Evaluation" is available free of charge from the Brandon Consulting Group, Inc. here.

The brochure describes the following services:

- Contract review: The evaluation of proposed contracts to determine redundancies or missing items and to assess the risks.
- Contract drafting: The development of an optimal technical contract draft to fit a particular situation.
- Contract negotiation: Obtaining favorable terms from vendors.

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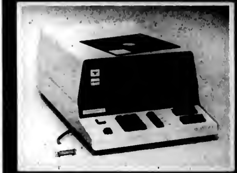
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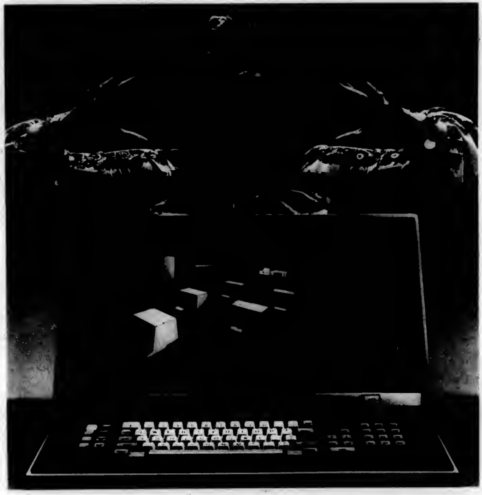

Model 85 is a display based system featuring up to 100MB disk storage, 15 interactive work stations, a multitasking operating system and concurrent communications.

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IN DEPTH
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TSUNAMI

By Charles P. Lecht

IN DEPTH

CHAPTER III
Part 2

Rising U.S. concern over our continuously eroding world computer systems development and sales leadership has been a recurrent theme in our news media in 1977-78. Prominent newspapers like the *Wall Street Journal*, the *New York Times*, the *Washington Post* and magazines like *Business Week*, *Fortune* and *Forbes* as well as virtually all computer field publications have printed alarming stories of inequities arising from our foreign trade policies, policies that clearly serve us poorly.

With most coverage focusing our attention on Japan, one might be tempted to conclude that if we resolved our difficulties in dealing with that country, we could stem further erosion of our leadership — even, possibly, reverse it. This is unfortunately not true for, as we have seen, while Japan's takeover of its own computer systems marketplace occurred before our very own eyes with dazzling speed, Germany has been preparing for the takeover of its own in a relatively unnoticed way.

With little or no Japanese competitive threat in Europe until the recently announced Siemens/Fujitsu deal, U.S. manufacturers taken as a group have seen their Western European marketplace control diminish. Thus, in 1977, U.S. vendors still controlled more than 65% of the general-purpose Western European marketplace (by installed value) and 70% of the German marketplace. But this is down substantially from the mid-'60s.

Not that the absolute value of the U.S.-owned computer business in Western Europe in general and Germany in particular has diminished. Indeed, the estimated $37.5 billion world marketplace in 1978 will yield yet increased revenue for U.S. manufacturers who will continue to dominate it (more than 65% of the world marketplace is U.S.-controlled).

However, the steep growth rate in Europe (most of which is in Western countries) is being matched only in Japan, with growth in the U.S. marketplace relatively slow; less than $2 billion as opposed to Europe's $6 billion. (see Figure III-8). Since most of the U.S. manufacturers receive half or more of their revenues from abroad, the loss in market share which is being experienced in Japan and Europe is serious.

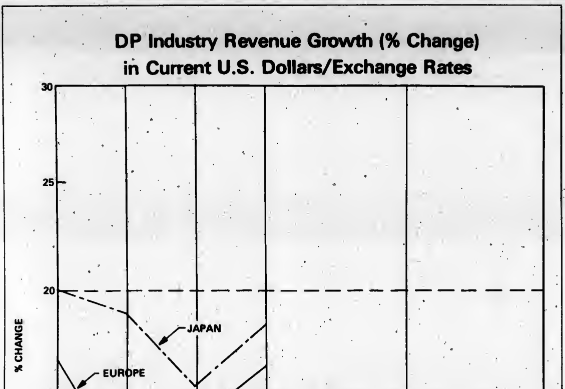
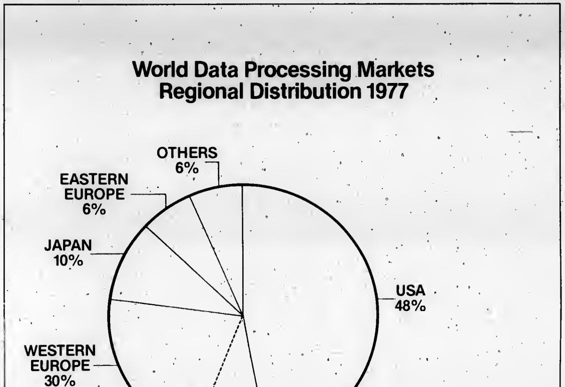

DP Industry Revenue Growth (% Change) in Current U.S. Dollars/Exchange Rates

Figure III-8

Earlier in this chapter, I noted that a loss of U.S. market share in Western Europe could in part be attributed to factors not directly related to competition. The continually unfolding definition of the marketplace caused by introduction of a sea of new devices employing microcomputer technology, as well as the lowering of the cost of developing computer systems in general, has stimulated the business of heretofore cash-poor contestants. Also, shifts in intercompany relationships, alliances with non-U.S. manufacturers and outright sale of U.S. high technology assets is contributing to the U.S. loss of market share.

That our market share loss is in any significant way related to the emer-



World Data Processing Markets Regional Distribution 1977

SOURCE SIEMENS—UPDATED BY ACT/TAG

Figure III-9

gence of superior or equally competitive products or an outgrowth of U.S. corporate weakness is not the case, however tempting it may be to explain it this way. The less ruggedly individualistic are wont to place blame for loss of market share on *both* U.S. corporate ineptitude and government foul-ups They argue that, as the computer industry grew, governmental and private industry entities jointly took full credit, whether or not they deserved it; now, as it diminishes, they must take the credit on the same basis.

Tsunami's thesis supports the most conservative of positions on this matter; namely, that whatever blame may be placed on the U.S. computer industry for not maintaining its momentum worldwide, governmental policy, or the lack thereof, is the overriding cause. Now that the European marketplace may equal that of the U.S. in size by the end of this decade, a marketplace which as we have stated earlier is growing at a lesser rate, it is indeed serious that we are losing ground in the former.

If in our examination of the reasons underlying our loss of West European market share we set aside the factors beyond our power to control, we may notice that German-based (though not primarily German-owned) manufacturers offer the greatest threat to our home-based/home-owned manufacturers in Germany and Western Europe. These, along with French, English and Italian-based manufacturing organizations, are, minimally, siphoning off jobs from the North American continent to Western European countries (U.S. industry manufacturing in Western Europe accounts for the majority of the $16.5 billion 1978 computer systems marketplace).

With Siemens, Nixdorf and other German-owned/German-based manufacturers increasing their share in the largest Western European marketplace — namely Germany — and German-based (though not necessarily German-owned) industry commanding $5 billion or approximately 30% of the Western European marketplace, we can conclude that any replacement of U.S. ownership of manufacture and support so essential to sales in Germany will erode U.S. leadership in Western Europe.

Such replacement may in fact occur for reasons other than increasing technological capability; the currency value imbalance between Germany and the U.S. is also a contributing factor. While the strength of the deutsche mark against the dollar benefits U.S. imports to Germany, it also increases the need to move operations home again, or elsewhere.

With marketplace opportunities swiftly increasing in Western Europe as we withdraw our manufacturing to, say, U.S. soil again, I cannot help but believe that any gains to be made through our now lower manufacturing costs will be offset through our mere lack of presence where the action is. Those who argue possible gains

(Continued on Page 48)

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through currency considerations may indeed be right in the very short term; as the U.S. once did, German companies are now looking to the U.S. these days for a cheap labor pool of which to take advantage. In the long term, however, the brutal reality of relocating a plant, its personnel, technology, etc. and the loss of sociopolitical status in the local manufacturing theater will have a severely negative net effect on U.S. companies. And with French- and English-controlled and government-supported industry increasing their ownership of their own marketplaces, evaluated at 18% and 20% of the Western European marketplace respectively, the trend is for European companies to break the yoke of U.S. control of the computer industries in Europe, as has already happened in Japan.

Figure III-9 presents a picture of the role of Western Europe in the world market. It shows that Western Europe is indeed the second largest marketplace in the world (30% vs. 48% for the U.S. by if-sold value today).

No Alternatives Lacking

At first blush, Germany appears to be a still less significant marketplace than Japan, 9% vs. 10% respectively. But the self-contained character of Japan's marketplace has made it a particularly difficult one to service by anyone lacking the extraordinary resources required to do so and, thus far, only the U.S. can satisfy the still-growing Japanese need for foreign technology. Indeed, we have seen that the growth of an indigenous Japanese computer industry was traceable in part to an absence of alternative sources.

Germany, on the contrary, suffers no such lack: Thus every emerging or potential competitor that is based in the European Economic Community (EEC) and every current EEC-based electronics company would together be able to fill the void that the loss of U.S. industry leadership in Germany would leave.

And a loss of control of the German marketplace would mean the loss of Western Europe; losing Japan would have no such important impact in the Far East.

While British-owned and French-owned manufacturers maintain a significant presence in their domestic marketplaces, and Germany increases

(Continued on Page 49)

SIEMENS

Siemens is the leading West German manufacturer of electrical and electronic products. The company markets most of its products (but not DP systems) in nearly every country of the world.

Siemens' corporate revenues totaled about 25 billion deutsche marks — about $12.5 billion — in the fiscal year ending Sept. 30, 1977; however, its DP division accounted for only 5% of this total. In the past, computer systems were more or less viewed by Siemens as a means of reinforcing its image as Germany's leading electronics company.

However, Siemens is now a more aggressive participant in the DP industry. The DP division currently operates unprofitably with an estimated net loss in the last fiscal year of about $75 million (although Siemens is subsidized by the German government to the tune of approximately $50 million per year, an agreement scheduled to expire by 1980).

The Siemens sales policy is primarily oriented to improving its market share (which increased from 5% in 1965 to 20% in 1977). Therefore, Siemens is usually very flexible with regard to pricing, contractual conditions and manpower/conversion commitments.

To increase market shares, Siemens aggressively attacks the IBM customer base. To be successful in that market, the company usually imitates — as far as possible — many of IBM's marketing activities and usually offers higher performance systems at lower cost (10% to 15%). However, the company does not imitate IBM in its software philosophy: It does not use IBM systems control programs.

With a market share in the Federal Republic of Germany of about 20% by value, Siemens is next to IBM (58%) in the "general-purpose" computer rankings in Germany. Belgium and France are the company's second and third largest markets outside Germany. Siemens' European market share is approximately 7%, but its worldwide market share is only approximately 2.1% (by value).

According to German market watchers, the profit situation of the Siemens DP division may become worse in 1978 because of the price reductions Siemens was forced to make in 1976, 1977 and early 1978 to compete with IBM's 370/138, 148 and 158 and 3031 price adjustments. Obviously a Fujitsu/-Amdahl deal may improve the profit picture by 1979-80 as larger, more profitable systems are shipped.

The company is planning to exploit the U.S. DP market more fully by 1979-80, probably focusing its product strategy at the low-end, small business system, mini/microcomputers, terminals and/or office systems.

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IBM-GERMANY

The Federal Republic of Germany (FRG) represents IBM's second most important market, with 1977 sales of about 6.38 billion deutsche marks ($3.19 billion), up by 7.1% over 1976 or nearly 18% of total corporate revenues of $18.1 billion.

IBM/Deutschland employs 25,000 people and is a major exporter for Germany. It currently controls nearly 58% of the FRG market (down from 72% in 1965). Europe accounts for over $6 billion of IBM's gross income, with the FRG therefore representing about 50%.

IBM has major research and manufacturing facilities in the FRG, where it is reportedly developing its "E series" (entry-level systems to replace the 370/T15 through 148 systems). In fact, the original 370/115 and 125 systems were also developed in Germany.

Some of IBM's competitors claim IBM's applications software is too generalized and very expensive. IBM's lack of process control expertise and limited data communications experience have also been noted.

The current FRG shift in market interest toward small business systems, minicomputers and distributed intelligent terminal systems may have impacted IBM's growth in the FRG. However, the forthcoming E series and other distributed terminal products (e.g., enhanced and improved versions of the 3790) may correct this current weakness.

(Continued from Page 48)

its ownership of its own, the conclusion seems inescapable that the heretofore discounted threat of European-based/European-owned encroachment on the U.S. diminished (but still effectively controlling) share of the European marketplace will be raised from within Germany. In this bid, the Germans will no doubt have access to Japanese help.

Figure III-10 shows a distribution of market shares in Germany among the major contenders. The information is presented in terms of units as well as by if-sold value.

From these charts we can see that German-owned manufacturers command approximately 18% in units and over 20% in if-sold value. Thus, if taken as a group, these companies fulfill significant internal German requirements in a manner only exceeded by IBM.

Since Siemens controls more than 18% of the installed (if-sold value) base, the developing German thrust to control its own marketplace first, the West European second and onward from there is manifested mainly through Siemens. As Fujitsu's large processor technology flows into Germany through Siemens to combat the U.S. manufacturer offerings, and with the inevitable entrance of Amdahl Corp. (and possibly the son of Amdahl, otherwise known as Magnuson Systems Corp.), Siemens' hopes are significantly brightened.

Since Siemens and Fujitsu are the single most important forces shoring up the nearly 20% world market share enjoyed by Germany and Japan, companies like Univac and Honeywell Information Systems, Inc. not to speak of other worthy U.S.-based leaders, are facing across-the-board competition from two companies whose total assets favorably compare with the cumulative resources of U.S. DP manufacturers, save IBM. Not that I believe their cumulative resources, if brought to bear more fully on advancing their computer industries, would necessarily unseat our computer industry's second-echelon leadership. Both RCA and General Electric learned money alone would not work.

Seasoned technologists working hand-in-glove with marketing and administrative champions (e.g., Amdahl's situation) are indispensible ingredients. But all such things being equal, money really helps.

Direct Subsidies

Direct subsidy of Siemens and Fujitsu by their respective governments could well be the factor which determines whether those companies, and others like them, succeed or fail in further reducing US. control of the DP market. Indeed, that is what *Tsunami* is all about.

These contenders for the lion's share of the Western European market bring the resources of their governments to bear upon the problem of wresting market share away from their competitors in a far more targeted way than do the U.S. companies, whose access to direct government assistance tends to be significantly more circumscribed, both in terms of scope and "conditions" of use.

Some might claim that Siemens and Fujitsu themselves enjoy a sort of U.S.

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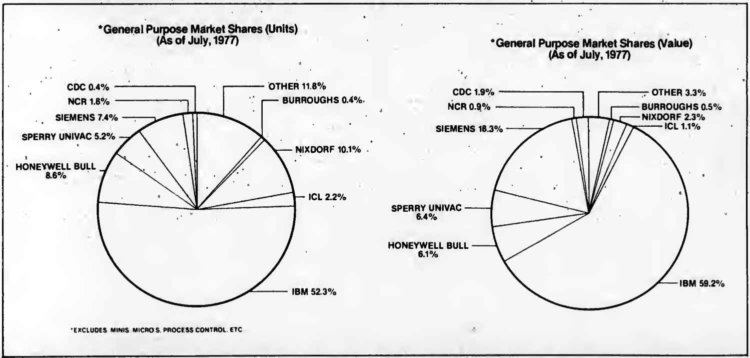

Figure III-10. This figure excludes minicomputers, process control systems, terminals and other special-purpose systems. In these product categories, the market shares (by value) are approximately as follows: Nixdorf, 25% to 30%; Kienzle, 12% to 15%; Philips, 10% to 12%; Olivetti, 10% to 12%; Triumph-Adler, 8% to 10%; and IBM-Germany, only 8% to 10% but rising sharply as a result of its recent System/34 and Series/1 activity.

TRIUMPH-ADLER

Triumph-Adler (TA), historically a manufacturer of both mechanical and electric typewriters, made a serious bid for a share of the DP market through office computers in 1969. The entry vehicle was the TA 100 series. This achieved a respectable degree of acceptance, consistent, perhaps, with the conservative cast of both its price and performance characteristics.

In 1972, TA abandoned its conservative image and practices with the so-called "volkscomputer," the TA 10 programmable office accounting machine. Its basic price of $5,000, exceptionally low for that time, made it extremely attractive in the West German market. Ten thousand units were sold within two years of its introduction, and substantial orders from abroad soon followed. Perhaps the most important effect of this development was to mark TA as a DP market contender with whom to reckon.

Corporate revenues for 1977 were 680 million deutsche marks ($340 million), 30% of which were attributable to office computers. Accounting for this strong performance were the TA 20 office computer, the low-priced ($4,450 entry-level) successor to the TA 10, and the order for 4,000 specially engineered TA 1000 intelligent terminals placed by the German Federal Railways.

The TA 20 utilizes U.S. technology (the Motorola M6800 microprocessor), and is machine-code upward-compatible with the TA 1000, a large office computer (priced from $9,000) with 4K to 40K bytes of addressable main memory.

The TA 1000, incidentally, is of some historical interest, inasmuch as it was the first West German office computer to offer a full CRT display as an option. Further, it was the brainchild of Nixdorf's former chief designer, Ing Muller; the man responsible for Nixdorf's 820 and 900 processors, elements fundamental to the success of a number of Nixdorf (and other company) products.

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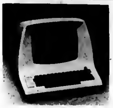

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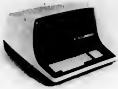

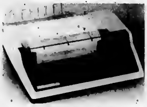

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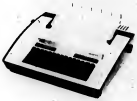

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(Continued from Page 49)

government subsidy, albeit an indirect one. For, as we have said elsewhere, the uncontrolled transfer of U.S. technology to other nations (presumed to be friendly) has led to the stimulation of non-U.S. competition in marketplaces which, if the various figures we see are to be believed, are expanding more dramatically than our own, domestic market.

That I associate the lack of a U.S. policy to guard our leadership position against preventable decline with a "subsidy" to, say, German industry speaks more to the net effect of our position than to its underlying purpose. Inhibiting the progress of foreign technology is not our goal; what we need is a coherent statement of the "rules of the game" so that we do not wind up imposing too grave a handicap upon ourselves — through sheer inadvertence.

This point of view is underscored by Frank T. Cary and John R. Opel in IBM's Jan. 31, 1978 "10-K Report," wherein they state: "The current proposal to repeal the present system of U.S. taxation of foreign earnings would put U.S. corporations operating overseas at a serious disadvantage by raising their tax costs significantly relative to foreign competitors. Today, no foreign government imposes such tax handicaps on its own companies competing abroad. In fact, most foreign governments help those companies in a variety of ways, even including direct subsidies. Restrictive U.S. tax measures not only make American companies less competitive, they also reduce U.S. jobs that depend on exports.

"IBM and many other businesses have a great deal riding on the success of the current negotiations under the auspices of the General Agreement on Tariffs and Trade (Gatt) that would reduce both tariff and non-tariff trade barriers. Some 40 countries have duty rates on data processing equipment at least twice as high as those of the U.S.— a disparity that we hope the Gatt negotiations will reduce."

Balance of Power Equation

Domination of the Western European marketplace by indigenous industry has far-reaching implications in the balance-of-power equation. At present, the U.S. controls only the export of technology to unfriendly powers, whose ability to threaten us we thus presumably limit.

At that, these potential adversaries find it all too easy to circumvent our strictures on direct export, having discovered that "comparable" (i.e., the same) technology can be acquired from other, cheaper sources. The waves of change are indeed active everywhere.

Germany has the fourth highest computer density (exclusive of minicomputers and other special-purpose devices) in terms of the ratio of the value of its installed general-purpose computer base to its gross national product. It is also surrounded by countries

(Continued on Page 52)

NIXDORF

Prior to 1968, Nixdorf restricted its activity to development and manufacturing for other vendors, such as Honeywell and Wanderer. (In fact, Nixdorf built the Logatronic office machine for Wanderer, which subsequently became the basis for Nixdorf's own, popular 820 series).

Today, Nixdorf is a very aggressive worldwide development, manufacturing and marketing company with a product line spanning the 65,000 to 250,000 deutsche mark (DM) range ($33,000 to $125,000). With about 60,000 small systems and terminals installed, the company claims to hold nearly 35% of the Federal Republic of Germany (FRG) market (representing the installed value of small business systems and minis in a price range up to DM250,000).

Nixdorf announced many (if not most) of its new products during the 1975-76 period, so more than 75% of all systems shipped to date are only two to three years old. These products include the 8864 banking terminal (with an order backlog of DM250 million at year-end), the new, highly modularized 8811 Datatel terminal and communications system (this very advanced product includes its own modem on a single chip), the 8815 word processing system and the Model 880 series disk-oriented and workstation systems.

The recent acquisition of Entrex in the U.S. reinforced Nixdorf's strong position in the intelligent data entry and small business systems market.

Company worldwide revenues in 1977 were DM839 million (about $420 million), up more than 22% from 1976, with nearly 55% of sales originating from within the FRG and 45% generated abroad. Nixdorf is proud of the fact that its revenue per employee — about $50,000 — is one of the highest in the industry for a company of its size (8,668 employees).

Nixdorf's primary product thrust is centered upon user (workstation)-oriented DP systems, and the company sees itself as a "pioneer" in the drive for acceptance of "the desktop computer in the normal office."

Nixdorf works very closely with a number of German software houses. Company spokesmen point out that Nixdorf is the first indigenous computer company to have given its partners their own booth at the Hannover Fair. This, they feel, dramatizes both their seriousness about software and their willingness to acquire needed skills wherever they are to be found.

Languages currently supported by Nixdorf systems products include Basic, RPG and Cobol. The company also supplies its own, highly modular application programs such as the Comet software package, a parameter-driven or user dialogue system.

Nixdorf's targeted markets are banking, retail, manufacturing (the company has "close connections with Ford and GM in the U.S.") and government agencies. In geographical terms, Nixdorf's No. 1 market is the FRG, followed by the U.S. (the company is considered to be one of the few "foreign" vendors thus far to have achieved a significant measure of success in the U.S. small business systems market) and France (with about 5,000 installations).

Government R&D support amounts to approximately DM20 million to DM25 million annually, with major development activity focused on bubble storage device applications (currently using a 40,000-byte chip), microprocessor-based workstations and point-of-sale terminals. After a long battle, Nixdorf recently received the FRG government's provisional approval to attach the Datatel terminal to the postal, telephone and telegraph (PTT) network.

(Continued from Page 51)

which have yet to achieve mean density status (see Figure III-11).

A vibrant, well-managed German-owned computer industry within the EEC has every chance to one day rule that marketplace. Its privileged access is guaranteed twice over — by EEC law and by distance considerations. Tariffs and support costs are representative of these.

However, we should note that Germany's "easy" achievement of Western European leadership via either its home-owned or home-based industries would still require an intense effort. This is because its marketing methods and the image the support of those methods may have internationally both cry out for improvement.

Lufthansa's "Red Baron" campaign suggests the way, although the implicit offensiveness of this military image illustrates what many non-Germans could reasonably view as the sinister side of the otherwise endearing German sense of humor. The DP industry has problems enough in the popular mind without surrounding its products with smiling Prussian officers. Perhaps a Siemens "Little Red Riding Hood" or a Kienzle Schwarzwalder elf would be more effective.

We are joking a bit, of course, but the need of German industry to soften its image in order to increase its acceptance cannot be ignored, and should figure in its planning.

Germany's data processing-related expenditures represent about 25% of all of Europe's with an estimated 55,000 or more general-purpose systems installed as of 1977. Figure III-12 presents a breakdown of the German marketplace by product class.

The almost $1.5 billion net marketplace in 1977 (defined by local production plus imports minus exports) showed a surprising resiliency in its recovery from the 1975 recession. Of the 1977 total, add-on memories and peripherals accounted for almost half, mainframes totalled about 25% and minis, along with special devices, made up the remainder.

In Germany's installed base (valued at nearly $16 billion in 1977), special-purpose minis and process control computers constitute about 50% of the units and general-purpose systems the remainder. In the special-purpose category, Digital Equipment Corp. is the leader with an estimated 25% of the to-

(Continued on Page 53)

KIENZLE

Kienzle Apparate GmBh, a family-owned company based in Villingen in southwest Germany, has long enjoyed an excellent reputation for achievement in high-precision, fine mechanical engineering. Starting from instrumentation and industrial clocks, and later tachographs, it expanded its operations via office accounting machines into the office computer market in a manner that recalled the growth of Burroughs Corp. Like Burroughs, in fact, it was the leading supplier of keyboard accounting machines to banks in the local market.

Kienzle products fall chiefly within the $20,000 to $75,000 price range and include the 2000 family, competitors of the IBM System/32 and System/34; the Model 6100, in the same class as IBM's System/3 Model 15; the Model 1200, functionally comparable to the IBM 5110; and the Model 3700 banking terminal, a near-equivalent of IBM's 3600 series.

Kienzle initially showed some reluctance to abandon the electromechanical accounting machines upon which much of its earliest success had been based. However, in 1975, it introduced the 2000 entry-level office computer mentioned above and made not inconsiderable inroads into the DP market with it.

The System 3000 banking terminals also earned a credible market position for Kienzle; the banking community, with which Kienzle had a longstanding relationship, placed large orders for members of this family and contributed to its financial viability.

Kienzle has approximately 15,000 systems installed, with about 90% of them in Western Europe and 10% of the base in Japan and other countries. Single and multistation (multiuser) systems represents 50% to 60% of total sales, followed by terminal products with 15% to 30% and data capture equipment contributing another 10% to 15% of total Data Systems Division sales, which were 500 million deutsche marks (DM), or $250 million, in 1977.

Nearly 55% of this total revenue was from the Federal Republic of Germany (FRG), with the remaining share coming from Europe, Japan and other areas. The latest statistics suggest Kienzle has about 12% to 13% of the FRG "mini" market by value.

Unlike IBM's "general-purpose" product thrust, Kienzle's marketing emphasis is on tailored packaging of hardware and software for very specific markets.

Future company product direction will include the "total" office environment, with Kienzle providing products for data, word, image and voice processing and a wider range of more general-purpose minicomputers with generalized software tools for easier development of specific market applications. With these products and strategies, the company hopes to double its revenue base during the next five years.

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(Continued from Page 52)

tal 17,000 or so units installed.

Siemens/Telefunken is next with nearly 18%, Texas Instruments, Inc. has 7% and Hewlett-Packard Co. and Data General Corp. have 6% each. AEG Telefunken and Dietz both have more than 5%.

All other domestic and foreign manufacturers comprise the remaining 27% of installed units. General-purpose shares are as shown in Figure III-10.

Applications that utilize advanced technology to support industry and social affairs seem more widespread in areas relating to process control than in the white-collar arena, although the usual banking, manufacturing, delivery, etc. success stories are there for the citing; one has only to read the annual reports and other literature issued by German companies to be impressed by their achievements in these fields.

But in the process control and related areas, German skill is unexcelled. From plant automation to medical science, Germans have excercised world leadership in metering technology, feedback control systems and others which demand a well-planned man/machine symbiosis, a skill which should pay off handsomely in the future. For the long-term promise of high technology is not augmentation of machine technology by further machines, but in our rededication to augmentation of human capability by machines — to extend our abilities to be free and more productive.

Post Office Moves

Germany, through its Federal Post Office (FPO), operates Europe's most expensive and reliable voice-grade telephone system. However, the technology employed is, as in most of the advanced, developed nations of the world, suffering from electromechanical obsolescence, however brilliantly maintained it may be.

With more than adequate capacity, Germany's FPO frowned on the leasing of dedicated long lines; until 1973, it was virtually impossible to obtain such lines for speech (as distinct from data).

The German FPO, like our AT&T, was and still is faced with the prospect of premature retirement of equipment in order to accommodate the sudden emergence of a new computer systems requirement for integration into its networks.

In 1973, apparently hoping to avoid the problem of technology stumble caused by the swift introduction of new, much cheaper replacement technology, the FPO decided to develop a separate data network. The FPO's decision to implement its Electronic Data System (EDS), an all-digital data network time-division multiplexer multiplexed over trunk routes under computer-stored program control equipment made by Siemens, followed its implementation of the Datex 200 service (1967).

The latter provided an overlay Telex network boosted to 200 bit/sec and able to run Ascii-8 bit streams. As the EDS network goes into service (Mannheim went live in August of 1976), new, improved Datex services continually emerge (Datex 2400 in 1976, Datex 300, 4800 and 9600 in 1978).

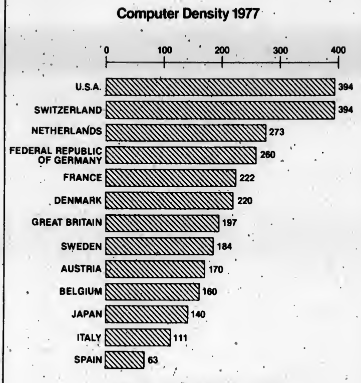
Datex 2400, 4800 and 9600 are full-duplex synchronous services, while Datex 300 is a new character start-stop service slated to take over asynchronous traffic from the old analog-switched Datex 200. Telex services are also being transferred to EDS.

The Datex services are all-digital, circuit-switched services in the manner of AT&T's DDS, and not packet-switched services, although the Siemens EDS exchanges have the facility to be programmed for packet switching if required.

In addition, a form of leased line facility, called the "Direct Call Network," is also available on EDS, but again only for digital data. Data circularizing on a single call, abbreviated dialing codes, closed user groups and auto-dial by computer are all available under Datex, but only for digital data.

The FPO pursues a fairly liberal

(Continued on Page 55)



COMPUTER DENSITY IS THE RATIO OF INSTALLED COMPUTER BASE TO THE GROSS NATIONAL PRODUCT OF A COUNTRY

SOURCE: SIEMENS UPDATED BY ACT/TAG

Figure III-11

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(Continued from Page 53)

"post-Carterfone" line attachment policy. Users may obtain telephone handsets, teleprinters and PABXs of any size either from the FPO or from private manufacturers. But the FPO makes an exception for modems, which must be obtained from the FPO. The reason fot this may be to use a high modem rental to divert digital data users to the new and slightly cheaper Datex services.

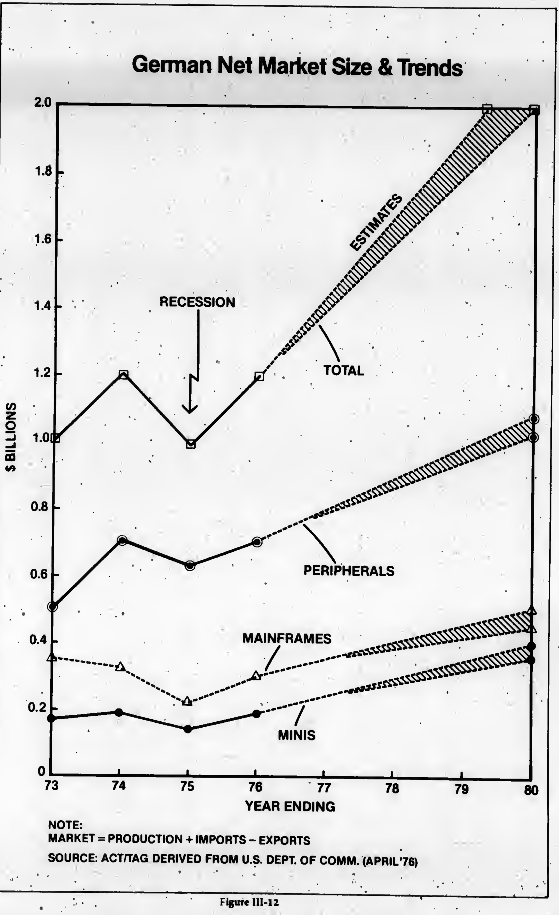
One can only conclude that the headlong rush of computer systems and communications systems technologies will be "handled" in Germany, but the master plan (if one exists) for doing so itself requires modernization. Hobbled by bureaucracy, the government-owned FPO will find it hard to implement the kinds of private-sector facilities being readied by the IBM/Aetna/Comsat group's Satellite Business Systems (SBS, or the Service Bureau in the Sky.).

For that matter, with AT&T's Advanced Communication Systems (ACS) preparing its programmed future alongside SBS's, FPO officials may just have decided the current success of the German computer industry should continue to be based upon yesterday's strategy of cautious, watchful waiting.

Piggybacking and leapfrogging on and over U.S. investments in communications and computer technology, the German FPO and German computer industry have been eagles sleeping with one eye open.

Lecht is the author of five previous books on computer-related matters; The Programmer's Fortran II and IV, The Programmer's Algol, The Programer's PL/I *and* The Management of Computer Programming Projects *and most recently,* The Waves of Change.

He is president of Advanced Computer Techniques Corp., which he founded in 1962, and has lectured widely for such groups as the Association for Computing Machinery, American Management Association, American Society for Information Science; and Data Processing Management Association.



NOTE:
MARKET = PRODUCTION + IMPORTS – EXPORTS

SOURCE: ACT/TAG DERIVED FROM U.S. DEPT. OF COMM. (APRIL '76)

Figure III-12

Sperry Univac minis are doing

In Portland, Oregon, Sperry Univac minis help the Police Bureau come to the rescue hundreds of times a day.

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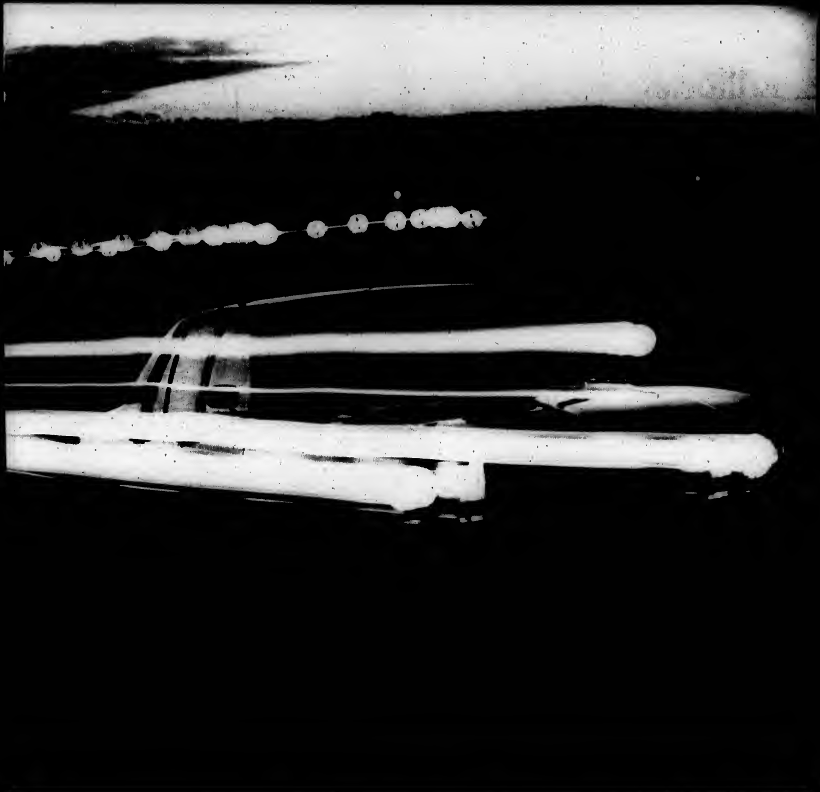

alarming things in Portland.

ing, scientific, instrument control, or data communications.

For more information, write to us at Sperry Univac Mini-Computer Operations, 2722 Michelson Drive, Irvine, California 92713. Or call (714) 833-2400.

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We'd like to hear from you. Even if your system application isn't as arresting as the one in Portland.

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Editorial

Sign of Progress to Come

The largest National Computer Conference ever blew through Anaheim last week and the showmanship on the exhibit floor would have made Walt Disney proud.

The size and enthusiasm of the exhibitors and show attendees showed the health and robust spirit coursing through the computer industry today and indicated that next year could be even better than this for the economic state of the industry.

Only the cynics point out that the same attitude moved throughout the industry and computer using community in the late 1960s before the Nixon recession put an end to the growth days.

But things are far different today. The exhibit floor here was crowded with innovative products that had solid technical foundation rather than the pie-in-the-sky products (typified by Viatron's $99/mo computer system) that abounded in the late 1960s.

The exhibitors went all out on the display this year, probably spending an aggregate of $8 million to $10 million on the display booths and equipment alone..

But while the display was massive — probably the most impressive ever in the computer business — it was not excessively marred by circus-type showmanship.

In fact, most of the exhibitors took the opposite approach, trying to tell their sales story through elaborate audio-visual presentations that actually had some educational content in addition to commercial messages.

The overwhelming display was worth waiting for — but in too many cases the wait was too long. Thousands poured into the exhibit hall on opening day, jamming the registration lines which at times might have stretched a mile long, out of the convention center and down the road next to the parking lot.

And while the exhibit was unbelievably impressive, less can be said for the technical program. There were moments of real brilliance in these sessions and many have to be classed as excellent. But at the same time, there were also more than a few sessions that were overly detailed and of little application to the general DP user.

The NCC should always be a showcase for computer science papers, and there is no quarrel with those sessions which were generally well attended and educational.

However, some of the applications sessions were too limited in scope and interest. For example, the show had a major theme of computers and energy, but this program was generally devoted to very dry applications primarily of interest to petroleum companies. One of these sessions on Monday had only 75 attendees and was quickly followed by another which only drew 30.

But quibbling about the program and the crush of people does not detract from the overall ambience and mood of the exhibit hall. If NCC '78 is a precursor, the computer community is only going to get larger.

Data Past

Eight Years Ago
June 17, 1970

LOS ANGELES — Users seemed to be waiting until they could more fully appraise the effects of unbundling before making a decision on the use of IBM's "for-a-fee" educational services, as well as on the use of any other outside services. Industry sources said IBM and its competitors found themselves below quota in this area.

— — —

WASHINGTON, D.C. — In a complaint before the Federal Communications Commission, Bunker-Ramo Corp. charged that Western Union was expanding its DP services in violation of existing tariffs, while allowing the deterioration of its common carrier services. The complaint charged that the carrier had favored users of its Securities Industry Communications System (Sicom) service at the expense of Bunker-Ramo's customers.

Five Years Ago
June 13, 1973

NEW YORK — The largest mainframe system operating at the National Computer Conference was an independently enhanced IBM 360/30 with 512K of storage called the Phoenix system and demonstrated by Greyhound Computer Corp. The Phoenix was said to better the performance of a 370/125 by 370%.

— — —

NEW YORK — Because of the success of its "new kind of meeting," the American Federation of Information Processing Societies (Afips) reaffirmed its decision to continue holding National Computer Conferences in the "population centers" of the country rather than in the traditional "convention cities."

'I Ask You, Gentlemen, How Can You Even Contemplate Separating This Innocent Child From Her Devoted Mother, Who Has Tenderly Nurtured Her From Infancy? . . .'

Letters to the Editor

Teaching DP Applications

The May 22 editorial "A Sad State of Confusion," regarding computer science programs in universities, is a start in the right direction. That there is a distinction between computer science and applied DP should be evident, but perhaps is not in some circumstances. Furthermore, major organizations, such as the one with which I am associated, do have elaborate educational facilities and programs that train people from all walks of life including college grads and computer science majors.

I believe that what is needed is your suggestion of "programs that teach DP as part of a more general discipline such as business, medicine, law or even liberal arts."

To be sure, many such disciplines in many institutions already provide such offerings. Their weakness or ineffectiveness stems from the fact that such programs are simply made available and in a fragmented manner.

Fawzi H. Hermes
Omaha, Nebraska

'Minor Flaw' Crept in Later

In a letter to the editor in the May 29 issue of Computer*world*, David R. Cummings correctly pointed out that the "i" in Erisa stands for "income" rather than "insurance." This "minor flaw" did not appear in the originally submitted manuscript for "Technician vs. User" [CW, May 15].

Rita Shoor
Wilmette, Ill.

Computers Used to Be Human

The note "Clearly Not a DP Error" [CW, May 8] deserves some elaboration.

You may be interested to observe that some 50 years ago, "computers" denoted people who perform computations. Indeed, computers were "very human" at that time.

To be more specific, let me add that Karl Pearson, the great English statistician, used "computers" in the original sense of this word, as evidenced by his publication "Tracts for Computers," No. 1 of which appeared in 1919. In this context, I refer to *A Computer Perspective*, Harvard University Press, 1973, Page 71.

Tore Dalenius
Brown University
Providence, R.I.

False Statement

In the May 8 edition of Computer*world*, the description of Ralph Leatherman's testimony in the Memorex Corp. vs. IBM case said:

"Some members of the government's trial team in New York privately claim that Leatherman has been coached by IBM to testify to a 'party line' and his recent deposition in that case was a cause for dispute because of his seeming lapses of memory when answering government questions."

That statement is false. No such dispute occurred and there were no lapses of memory, seeming or otherwise. Whoever the members of the "trial team" were either didn't know what they were talking about or didn't care about the truth.

I cannot believe that the "members" were lawyers, because such misrepresentations by lawyers are prohibited by the Code of Professional Responsibility and would be subject to disciplinary action.

Thomas D. Barr
Cravath, Swaine & Moore
New York, N.Y.

Reader Commentary

Students Good at Writing Have Future With DP

By Joseph T. Rigo
Special to CW

Prof. David Carson has a mission. He wants to make tech writers rich.

Carson is a former air force jet pilot, a retired colonel, who now runs the graduate program in technical writing at Rensselaer Polytechnic Institute (RPI) in Troy, N.Y. Carson has done a number of things to spice up the RPI program, but mainly he is forcing students to get acquainted with computers.

Every graduate student has to take a one-semester computer course that was designed especially for writers. It covers some of the basic concepts. Every student learns to do a few simple programs in PL/I and to design a small function for a text editor.

The RPI program also includes a course in graphics. And, of course, students have to do a great deal of writing.

The net effect is that this year's master's degree graduates are getting job offers from places like IBM and Bell Labs with starting salaries of $18,000 and $19,000. Who says MBAs have all the fun?

RPI also has a doctoral program. Now we may all agree that a Ph.D. in tech writing has got to be a joke, but one of the computer manufacturers will pay $25,000 a year if you have one. Not bad for a kid just out of school.

Two Basic Approaches

Carson talked about it a few weeks ago. The occasion was a meeting at RPI for about two dozen tech writing teachers from colleges around the country.

Carson loaded the agenda with speakers on computer writing topics, and he made his point. By the end of the first day, several of the assembled professors were asking how they could get summer jobs that would help them learn more about data processing.

They indicated that most schools put their tech writing courses in the English department, which is probably as good a place as any. It appears they have two basic approaches to training writers.

One approach emphasizes standard English courses with a lot of technical jargon thrown in. Students turn out an endless stream of papers about business and technical subjects. They are not required to take science courses or to specialize in any one area of interest.

For the most part, these students are trained to be editors. They will work with an engineer. The engineer will write the paper, and the tech writing graduate will review it for spelling, punctuation and grammar.

The second approach exposes students to an assortment of science topics. They go through a series of one-semester courses in biology, physics, chemistry, etc. They learn some of the basic concepts and the technical jargon in each area. The computer course at RPI belongs here.

Again, there is no specialization. A graduate may go into data processing or medical writing or become a science writer for a magazine.

For better or worse, both of these approaches put their emphasis on writing for a general audience. Students do most of their work for the English professor.

The professor may become knowledgeable in several science topics over the years, but he can't be an expert in everything. There is no way that he can know whether a student's description of an I/O command will make sense to an experienced programmer. The situation puts a severe limit on what can be covered in the writing courses.

Meanwhile, over in the university computer center, one or two computer science majors have part-time jobs as librarians or consultants. They document the center's own systems, prepare user guides and help other students solve programming problems.

These students are not part of any tech writing program, but they are getting first-rate experience in writing about technical subjects for a technical audience. Many of them become tech writers.

I would like to see more of the tech writing majors working in the

(Continued on Page 60)

The Human Connection

MIS Consultants Seek State-of-the-Art Image

By Jack Stone
Special to CW

I am taking this occasion to write about a very slowly growing new marketplace for the industry, one which is, to be sure, extremely customized, narrowly specialized, generally unprofitable, but very significant. This marketplace meets the needs for "motor-yacht-based-small-business-systems-for-MIS-consultants."

You see, consultants employ public relations as part of their selling armamentarium, as do major corporations. But since most consultants don't advertise, they must turn to other means of conducting their PR programs.

My particular strategy is to design, develop, construct, install, operate and maintain the world's first floating, all-computerized management information systems (MIS) consultant's office. My aspiration is to incorporate all the hardware and software necessary to demonstrate how the successful independent MIS consultant uses his talents in-house. Let me relate my progress toward this goal thus far.

I started my project last fall, when I acquired the "Artemis," a 1956, 54-foot, all-wood Chris Craft motor yacht. Already installed was a Gemtronics ship-to-shore VHF voice communications facility. This was fine until I received extravagant charges on my phone bill. It seems the phone company bills VHF calls on the "operator-assist" basis, plus a surcharge. So now I limit use of the facility to emergency calls.

I had also intended to use it for facsimile transmission — that was why I acquired a Qwip Systems facsimile machine, but I found that the microphone was incompatible with the Qwip interface unit.

My first encounter with an advanced electronics image having failed, I installed a conventional telephone (but it is a "Trimline") for dockside-only operation. The Qwip works OK on the phone, but is impractical for me because it takes too long to send a large volume of paper over the voice network.

So I brought on board my Texas Instruments, Inc. Model 56 calculator. (You may recall that I wrote about how it was grossly impacted by TI's 58 announcement at the National Computer Conference last year.) It turns out that the absence of hard copy drove me crazy when I tried to balance my books. So I retired the 56 and bought a Unitrex calculator with LED numeric display and plain paper copier. But, as my luck would have it, it's nonprogrammable. Also the paper feed is really hokey.

Word-Processing Capability

For preparing short pieces and correspondence, my on-board IBM correcting typwriter is neat, but since I am now committed to writing two books for Prentice-Hall, the "cutting and pasting", of volume typed manuscripts really demands a word-processing capability.

Besides, a micro-based business system installed in my after cabin would be just the thing to gain the attention of business prospects. So, to be sure I'm at the leading edge of small business technology (small meaning under $5,000 purchase price), I called on retail vendors to buy a machine to support my text editing and small business applications needs.

The Commodore Pet is a very clever machine, but the vendor stated that it had a few slight limitations for small business, no applications software, 40-character line on the tube and no disks!

Radio Shack has a 32K-byte "business system," an expanded TRS-80. The company provides some very basic applications, but the company rep said the firm is holding off on general business system software "until it has an established market" (which I translate into letting the OEM software vendors handle the software headache). No interest here!

The Sol System by Processor Technology was very impressive. I saw it drive a Diablo printer and produce camera-ready copy. Its performance and price far exceeded my needs, so I disqualified it. Further, there was no vendor-supported

(Continued on Page 60)

The Taylor Report

Insurance Policies Need Clearer Coverage Forms

By Alan Taylor
Special to CW

The procedure for getting insurance on data processing and data processors has never been particularly well organized and it is nice to see that some companies, like the St. Paul Companies, Inc., do offer errors and omissions coverage.

St. Paul deals mainly in the commercial area, and it leads in the fight for more clearly written policies. However, the company told me that actually only three of its many policies have been revised for purposes of clarification and that it will be a year before its DPers' errors and omissions policy will be reviewed. So what can be done in the meantime?

I recently read about the coverage offered in the DP areas and wondered how it could be explained in understandable English. Then I came across the solution right in the St. Paul production guide for agents. The guide's description of the coverage is much clearer than the definition in the policy. Whether the independent agents (or St. Paul) would like to see the policy bring out quite so clearly what the system does not cover is perhaps debatable — it might reduce their market. However, a prospective buyer would certainly want to know.

The two different summaries of the coverage appear in the accompanying boxes. The key words turn out not to be on the front page in the section marked "Coverage," but on the back page, where the definition of "data processing services" is provided. The restriction, hidden in the front-page phrase "as defined herein," includes the specification that the processing must be by "the insured's computer operator."

The St. Paul company thinks this definition eliminates a great deal of liability, and I'm inclined to agree. Expressing the policy terms in clear English would bring out this elimination of liability and put it up front in the coverage section. The exclusion of the on-line time-sharing system (which is now so common) and other matters that are involved would be immediately seen.

In fact, the coverage provided by the St. Paul policy seems to be quite limited. Looking down the list of exclusions, for instance, I see an exclusion of coverage to the liability of others "assumed by the insured under any contract or agreement." I

(Continued on Page 60)

Insurance Forms Need More Clarity

(Continued from Poge 59)

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. . . vs. Agents' Summary

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TONE 3

TSO for VS1

CHECK THESE FEATURES

- Edit with full screen capability
- Internal reader job submit
- Output retrieval with RES support
- System maintenance
- Program development
- Data entry
- System debugging
- Text editing
- Performance monitoring support
- User command interface
- [illegible]
- Operator console [illegible]
- [illegible]
- [illegible]
- Standard IBM TSO [illegible]
- Enhanced 3270 [illegible]
- Full ASCII terminal support
- No user SVC [illegible]
- No TCAM
- No VS 2 overhead

TONE

[illegible] TRASK AVE
GARDEN GROVE [illegible]
[illegible]

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4. *Administering your Standards Program*
5. *Assessing Current Standards Programs*
6. *Keeping Standards in the Mainstream*

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Writing Skills Needed

(Continued from Poge 59)

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In either case, I think that writers who are going into data processing should take more computer courses and forget about biology.

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Consultants Seek Image

(Continued from Poge 59)

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"Indeed," the vendor said, "the machine has an exquisite text editor, disks, upper/lower case and small business software all or less than $5,000!

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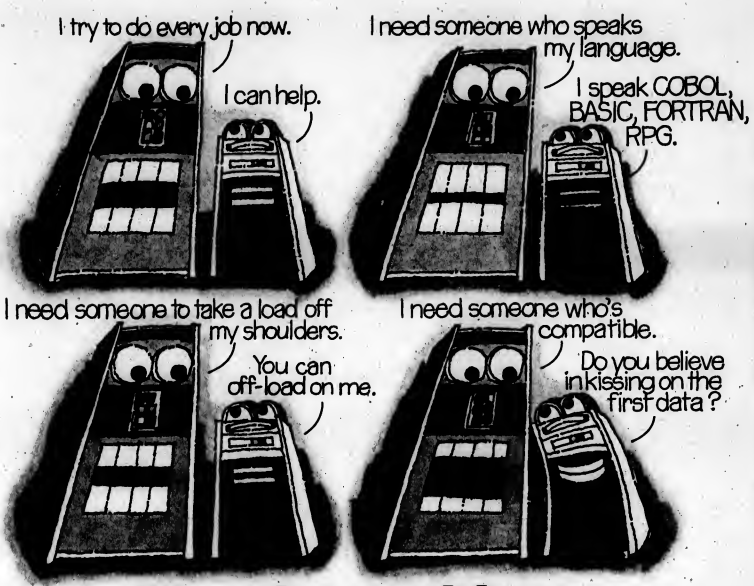
I try to do every job now.
I can help.
I need someone who speaks my language.
I speak COBOL, BASIC, FORTRAN, RPG.
I need someone to take a load off my shoulders.
You can off-load on me.
I need someone who's compatible.
Do you believe in kissing on the first data?

We solve problems without creating new ones.

Some computers can create more problems than they solve. Especially if they mean new ways to work. New languages to learn. And new staff to train.

Digital's interactive Datasystems are different. They're designed to work with you and your big systems. They're mainframe compatible, and they offer high-level software capabilities you're already used to. Such as COBOL, BASIC, FORTRAN, RPG, SORT, QUERY, and multi-key ISAM. All executing simultaneously. They also offer industry-compatible communications. As well as data base management capability, transaction processing capability and distributed data processing capability.

Using our tools, you can get maximum performance with a minimum of staff retraining. You can get a system that can communicate with the systems you already have in place. You can get high throughput at a low cost of conversion. You can do all this. And more.

And since Digital offers a broad range of systems, you can select the right combination of both hardware and software for your application. No matter whether it's transaction processing, general-purpose computing or performance-tuned applications.

In short, Digital offers everything you need to turn business problems like data entry, inventory control and customer-base inquiries into real business opportunities. To find out more, call your nearest Digital sales office, or write Digital Equipment Corporation, Business Products Group, MK-2/H32, Merrimack, N.H. 03054. European headquarters: 12, av. des Morgines, 1213 Petit-Lancy/ Geneva. In Canada: Digital Equipment of Canada, Ltd.

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Meet NCR's Migration Path Engineering concept for computer system

It means you don't pay a penalty for success.

Too many EDP systems prove to be blind alleys for their owners. When the need for additional power and versatility outgrows their system's capacity, they discover that the change to more capable hardware will entail sweeping software changes, too. Rewriting programming that has become obsolete overnight takes time, costs money and can disrupt their entire operation.

Not so for owners of an NCR 8000 series system. You'll pay no penalty for success. NCR's Migration Path Engineering insures that current programs can be transferred to a more advanced configuration without revision. No need to sacrifice your current programming to gain increased EDP capabilities; your software can move up right along with you.

Avoid the pitfalls of a dead-end system. The NCR 8000 series includes a state-of-the-art system designed to meet all your current EDP needs. As your requirements grow, the ease of your eventual transition to a more powerful configuration in the series is assured. And each of NCR's continuing additions to series will include the far-sighte advantages of Migration Path Engineering.

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NC
Complete Computer S

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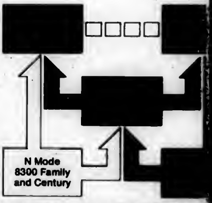

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- Standard IBM TSO commands
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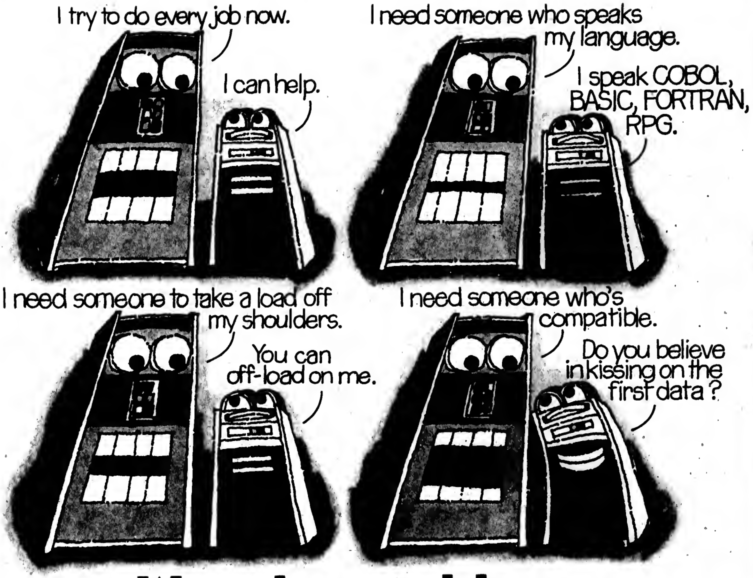
I try to do every job now.
I can help.
I need someone who speaks my language.
I speak COBOL, BASIC, FORTRAN, RPG.
I need someone to take a load off my shoulders.
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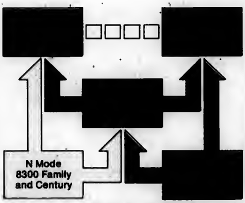

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Won't Work With 3300-11s

IBM Shop Upgrades—But Not Compiler

By Don Leavitt
CW Staff

DALLAS — The DP manager of a medium-scale installation here thought he could save his company $65 or $75 a month when it moved to an IBM 370/145 by using the Cobol compiler that had worked well in the previous 360 environment.

But Hank Berkley of Union Standard Insurance Co. isn't so sure of the real savings anymore, even though his company is no longer paying even for the older DOS-oriented ANS Cobol, IBM's program product 5736.

The problem, he explained recently, is that the compiler simply won't work with the IBM 3330-11-type disk drives from California Computer Products, Inc. that Union Standard brought in when it got the 370/145. The IBM documentation on the compiler indicates it works with 3330-type mass storage devices, but that hasn't happened in Berkley's shop.

The company is using Release 34 of DOS/VS, which supports 3330s, both Model 1s and Model 11s, so Berkley is convinced the problem is in the compiler. He acknowledged, however, that the compiler worked all right with the 3330-11-style units when the company had earlier releases of DOS/VS in place.

One problem, apparently, is that Release 34 distinguishes between the 3330 models, whereas the earlier operating systems did not. Berkley has also had access to the source code of the compiler and has found what he feels are the "10 or 12 instructions" that need to be added to solve the problem.

But IBM won't make the changes, and when Union Standard stopped payment on the compiler in October — "under terms of the licensing agreement, the product is guaranteed to work up to specifications and it doesn't. So we stopped paying for it" — the local IBMers apparently turned the problem over to legal counsel for some sort of ruling.

"In effect, we're getting all involved in bureaucracy, instead of getting someone to sit down and code the changes," Berkley said with frustration in his voice.

Meanwhile, the company is continuing to use the compiler with the Calcomp 2314-type disks it acquired when it had the 360. The compilations are much slower than Berkley would like — the channel time of the 370/145 is three times as fast to a 3330-11 as to a 2314, he said — but it does work.

The 3330-11s are being used for much of the company's production work, but they're "just plain inoperative" for compilations, the manager said.

He noted he might well be able to alter the source code of the 5736 compiler to work with the 3330-11s, but if he made any changes in it, IBM would be within its right to say the changes caused the problem and to withdraw all support for the product.

Limping along, as Union Standard is now doing, isn't the way Berkley expected to be operating, but he seems resigned to making do without paying for the compiler until IBM comes up with the logic that will allow it to work in the 3330-11 enviroment. Or perhaps provides a different compiler at the same cost.

Then Berkley will be able to claim the savings he expected to have all along.

Transaction Processing System Stretches Across HIS Level 6

WALTHAM, Mass. — The Gcos 6 MOD 200 entry-level transaction processing system from Honeywell Information Systems, Inc. is intended primarily for the company's newly announced Level 6 Model 23 minicomputer (see related story on Page 83), but it can be used on any of the Level 6 minis, according to a spokesman.

The software is capable of supporting a Level 6 CPU as a stand-alone system or as a multifunctional intelligent terminal in a communications network. Gcos 6 MOD 200 combines a rewritten executive and transaction components with the language processors and file systems previously available with Gcos 6, he said.

It permits simultaneous processing of on-line, interactive transaction applications; batch applications; program development; and remote job entry via the Hasp multileaving facility [CW, June 5].

Transactions can be written in standard Gcos 6 Cobol or in Transaction Control Language (TCL). Reentrant terminal management, invoked by TCL or application program Call statements, provides "an extensive data format, verification and editing facility and interactive screen form creation/definition," the spokesman added.

The ability to design and — if need be — redesign CRT screen formats from the terminal, without requiring recompilation of programs, makes the software easy to use by both a system builder and nonskilled clerks or production workers who are prospective end users, he said.

User access to transactions, files, forms and programs is controlled by administrator-assigned keys. A 16-ring security mechanism, said to be patterned after HIS' large-scale Multics systems, is used to separate access levels under a MOD 200 environment.

Gcos 6 MOD 200 is available in two separate packages. The Program Development System, including the system executive, CRT screen manager and Gcos 6 Sort and entry-level Cobol compiler, costs $5,050. Once that package is in place, other Level 6s need only have their own copies of the executive and the screen manager, for $1,900, HIS said.

Univac Extends 'DMS 1100'

ROSEVILLE, Minn. — Enhanced security and improved data independence are the main features of the Level 7 release of DMS 1100, the data management system for Univac 1100 systems, according to a company spokesman.

Access control down to the item level has been built into the data definition language. The data base administrator can tie authorized use of a data item, or the instruction needed to perform any given operation, to the user's access code or a screening performed by an installation-specific subroutine, the spokesman said.

Validity checking of data every time it is entered or modified in any way can also be mandated by the system under this release, he added.

Encryption and compaction facilities at the record level are also provided in the update and these, too, can be triggered by the presence of the appropriate user code or by checking through a screening subroutine, he said.

The DMS 1100 subschema facilities are also expanded. The subsetting of all data base objects, down to the item level, provides greater data independence because application programs are bound to their view of the data base (schema), he explained.

The program is therefore insulated from changes that are made to those portions of the data base not in its view. A greater degree of privacy is also provided because users are cognizant of only those objects that are of interest to them, the spokesman claimed.

DMS 1100 is available at no charge as part of the 1100 series operating system software.

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'Dfast/VS' Update Manages 3330-11, 3350

NEWPORT BEACH, Calif. — Support for IBM 3330-11 and 3350 disk systems even under versions of DOS/VS prior to Release 34 is said to be one of the highlights of Version 4.0 Dfast/VS, the disk management from Tower Systems, Inc. (TSI).

Generic device independence, allowing the user to change a tape file to a disk file, or vice versa, with no change in the problem program, is built into the update, according to a spokesman. This eases the development of tape-oriented programs, he said, since testing can proceed using disk space, which is more often easily available, until the run goes into production.

Automatic data encryption external to the user's program will scramble data written to disk. This "obviously" can be used to protect sensitive data and is particularly useful since it requires no program changes, he said.

A fourth enhancement, allocation by logical records, is said to allow the user to request allocation of Direct Access Storage Device (Dasd) area by the number of anticipated logical records. The user need not be concerned with device-dependent capacity calculations as the hardware environment changes, the spokesman noted.

Finally, an automatic secondary extent generation facility is provided to handle dynamic allocation of more disk space when an output file exceeds its original extent allocation. This feature requires no changes to existing JCL, the vendor noted.

Dfast/VS can be used in conjunction with IBM's DOS/VS, Software Pursuits' DOS/MVT or The Computer Software Co.'s EDOS environment, according to the spokesman.

The basic package costs $5,200 or $125/mo on a one-year lease, but typical implementations cost more since many of the facilities — device independence, automatic volume recognition and public space management, for example — are separately priced.

Tower is at 3901 MacArthur Blvd., Newport Beach, Calif. 92660.

Sycor Operating System Enhances 445 Performance

ANN ARBOR, Mich. — A multifunctional operating system that is said to significantly enhance the performance of Sycor, Inc. top-of-the-line 445 distributed data entry and processing systems has been introduced by the firm.

Called Omni, the operating system is highlighted by new memory mapping techniques which utilize the 445's 256,000 bytes of main memory to offer users a variety of capabilities for virtually any application, according to a Sycor spokesman.

"With our Omni operating system, the 445 will be one of the most comprehensive, efficient and flexible distributed processing systems available to users," the spokesman added.

"The Omni system allows the 445 user to concurrently run eight foreground and eight background tasks in virtually any combination of data entry, data communications and data processing. These 16 tasks can be running in Cobol, Basic and TAL 2000 (Sycor's own terminal application language), IBM 3270 emulation and utility programs," he said.

With Omni, a 445 system is said to be able to incorporate up to eight display units which may be under the control of different systems programs. Economy of memory usage is achieved by systems programs being shared by display units with no duplication of interpreters, and application programs can be shared by multiple Data Stations, further conserving memory, according to Sycor.

Users can reportedly run their application programs in any of the three supported systems languages. The operator simply requests the application program which is automatically turned over to the appropriate systems program for execution, Sycor continued.

Sycor will provide the Omni multifunctional operating system to users at no cost, the firm said from 100 Phoenix Drive, Ann Arbor, Mich. 48104.

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Librarian for IBM Users Adds Monitor Independence

GERMANTOWN, Tenn. — IBM DOS and DOS/VS users have another software supplier to consider. Pycco Computer Systems has just introduced Marian, an on-line librarian package that is said to work with any teleprocessing monitor, and a compression routine for IBM 3270 output screens that may save up to 50% of a user's transmission costs.

Marian's monitor independence is useful, a spokesman explained, because there are times when teleprocessing software may be changed to accommodate a new operating environment; such a change shouldn't have to impact the development staff, which should be concerned strictly with the applications it is building for others, he said.

Marian also has a date option feature that in effect time-stamps each modification to the stored library, as well as "all the other features of any good online library package," he said.

Since the library package was designed to work with a CRT terminal, it gives programmers a direct means of entering, reviewing, updating and retrieving data, JCL or source code without hard-copy input or output. That speeds the development and saves paper, the spokesman noted.

Marian permits all source code to be accessible for review by project leaders and managers; therefore, it also allows enforcement of uniform programming standards, he claimed.

Described as easy to use, Marian is available now for $3,000.

The compression routine was developed as an adjunct to Marian, but is available as a separate product. It can be called by any application program after that program has built an output screen.

The compression routine costs $54. Pycco is at 1806 Malabar Drive, Germantown, Tenn. 38138.

Service Supports Analysis Jobs

WELLESLEY, Mass. — Described as an integration of large-scale computing capability, advanced and complete software and the help of a staff of expert consultants, the SDL Statistical services supports researchers and others with complex data analysis problem through the remote computing facilities of SDL International Inc.

The SDL service utilizes the company's IBM 370/168AP-based data center in Ottawa and provides, as a starting point, access to several software systems already established and recognized for their general capabilities. These include BMDP, SAS, Osiris 111 and SPSS/SCSS, a spokesman noted.

A number of software packages developed by SDL to support more specific statistical problem areas are also available through the service, he said, citing SDL/Bras, a biased regression analysis system, as one such offering.

Others include SDL/MDSA, which handles Multidimensional Scaling Analysis; and SDL/SES, a Structure Equation System. A Time Series Modeling System (SDL/TSMS) and an Analysis of Contingency Tables System (SDL/Acts) are also available.

The systems can be processed in either a batch or interactive mode. The operating system is an MVS/MVT multiprocessing environment.

The software/hardware facilities are supported by a staff of specialists in the field of applied statistics and a telephone "hot line."

Although SDL has a $60/mo minimum fee for use of the facilities, actual costs are based on resource use only. There is no inital fee nor monthly charge for the statistical support "unless the client contracts for a major analytical effort," the spokesman added from 2 Sun Life Executive Park, Wellesley Hills, Mass. 02181.

IBM Eases Use of 'PCF'

WHITE PLAINS, N.Y. — The encoding/decoding capabilities of IBM's Programmed Cryptographic Facility (PCF) software [CW, Dec. 12] are easier to work with now, especially in terms of creating secure data sets of sensitive data, with the availability of the Access Method Services Cryptographic Option (AMS/CO), according to an IBM spokesman.

PCF enables users to work with data, he acknowledged, but it has been rather heavily oriented toward protecting data going out over communications lines, rather than data being stored for reuse at the originating site or at a site which receives the storage media physically.

AMS/CO differs from the basic PCF in that the user of an AMS/CO encoded data set must know the 56-bit key used to encrypt it, in order to decrypt the stored data into usable, clear text. With its communications orientation, PCF and its related facilities passes the key with the transmitted data and the file is converted to clear text automatically, after which the key is erased, the spokesman said.

A version of the AMS/CO that works with IBM's OS/MVS is expected to be ready for distribution this month; another version, for OS/VS1 installations, is scheduled for release in August.

The monthly license fee of AMS/CO is $50, the spokesman said. PCF costs $250/mo.

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Definition of 'DBMS' a Matter of Personal Ideas

By Stephen L. Robinson
Special to CW

Data Base Corner

Having started a bit of a controversy with the "Data Base Corner" on what constitutes a data base management system (DBMS) [CW, April 17], it is necessary to indicate what *I* feel constitutes a DBMS.

"It is clear there is no universal set of characteristics which define a DBMS. The following is a very personal view of DBMS characterisics.

It is not an Ansi standard or even a static standard (I tend to change my own mind about various criteria when confronted with sufficient argument contrary to my original view).

Like it or not, the bulk of programming today is done in Cobol and Fortran. Most companies have a rather large investment in systems developed with these languages and a rather large investment in the education of programmer/analysts who are skilled in the use of compiler languages.

Unless someone develops a DBMS which has a self-contained programming language (in the broadest sense; this might be a procedural language, another compiler language, etc.) that is so superior to Cobol and Fortran that everyone is willing to switch, I believe a DBMS must have an effective interface to compiler languages.

Such an interface might be via a CALL mechanism or via an embedded language which is processed by a precompiler (such as Codasyl).

Intrafile Relationships

Intrafile record relationships are, in my mind, the single most important characteristic of a DBMS. A DBMS should possess the ability to employ a field (element, whatever) as the criteria to create a key (descriptor, linkpath, etc.). Once established as a key field, that field may be used to select records with a particular value.

Such selection should allow at least for the selection of a "first" record that meets the search criteria physically first on the disk, logically first by order of addition to the file or by some other criterion) and the subsequent retrieval of "next" records that possess the search criteria. The DBMS package should detect the "end" of such a sequence and dutifully report it to the application program.

Notice that nothing has been said here about the mechanism for creating a key. It may be pointers embedded in the records themselves or a table external to the records. What is important is that such extraction be accomplished without looking at every record in the file.

Clearly the DBMS should be responsible for maintaining the relationship, however implemented. Desirable, but not absolutely necessary, are the following additional criteria:

- The ability to perform logical sequential processing based on the values of a key field.
- The ability to build intrafile record relationships based on information exogenous to the records; that is, not to have fields in the records which "support" the relationship. This is a characteristic of the Codasyl DBMS.
- The ability to impose ordering on such relationships. (*Unnecessary* ordering of such relationships is one of the major design errors in list structured systems.)
- The ability to create — and destroy — such relationships while the file is up and available for processing by other users. (This is presently restricted to inverted systems.)
- The ability to have the package perform Boolean searches on such relationships. This should be possible from compiler-level application programs and query languages (or report writers).
- The ability to distinguish, without special encoding, between a missing numeric field and a field with a value of zero (analogously, for alpha fields and blanks).

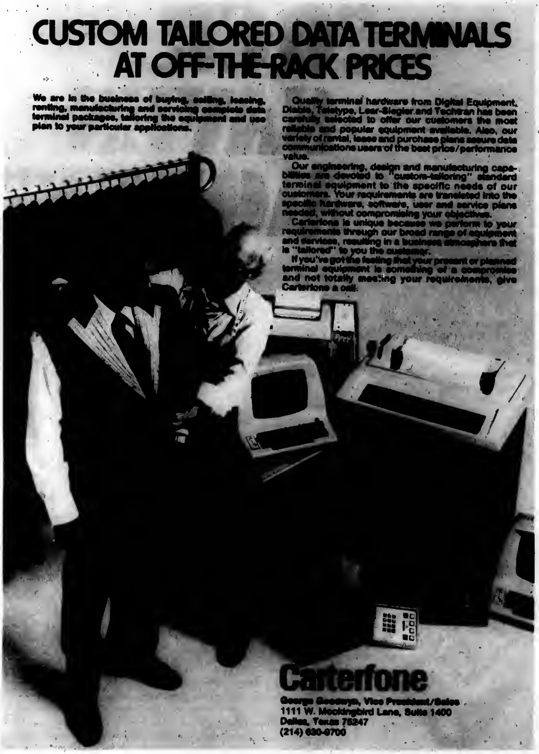
Interfile Relationship

Interfile record relationships are somewhat less important than intrafile relationships, since most activities that can be done with formal interfile relationships can also be done by multiple file searches. There are, however, two major reasons for having such a facility.

- First, program logic is simplified. As it is, far too much of the code in application programs that utilize a data base package is devoted to nonapplication logic. Multiple file retrievals and the associated search logic can be difficult to debug and even more difficult to read (for maintenance purposes for example).
- Secondly, the efficiency of multiple file searches, without a formal relationship, can be so poor as to cast doubt on the rationale for performing the search.

An interfile record relationship

(Continued on Page 70)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Cobol Record Layouts Backed

SPRINGFIELD, Va. — The Recflow processor from Thorne Data, Inc. constructs record layouts for any size Cobol-based records. These records may be contained in files or may be any 01 level data structure in an ANS Cobol program, the vendor said.

Recflow graphically presents data fields and logically portrays levels regardless of programmer-assigned levels, a spokesman explained. The resulting layouts, produced on the user's line printer, are tailored in width and depth to fit programmer-assigned field and data name sizes.

Input to the processor may be a complete Cobol program or a series of programs, file descriptions, selected 01 level data structures or any combination of these possibilities. In all cases, the input must be syntactically correct Cobol free of basic diagnostics, the spokesman said.

Recflow will draw layouts for any 01 levels it receives until Working Storage/Linkage Section or Procedure Division entries are encountered.

Recflow operates through a standard line printer with 132-print positions. It was designed for most hardware systems, requiring as little as 64K bytes of storage and no changes in the user's system software.

The package costs $1,200 and can be ordered from Thorne Data at Tower Building Suite 500, 6320 Augusta Drive, Springfield, Va. 22150.

Definition of 'DBMS' A Fluid, Personal Matter

(Continued from Page 66)

should be maintained automatically by the DBMS or, optionally, should be under the direct control of the application program (i.e., take record number 17 in File A and "tie" it to records 146 and 273 in File B). The former is appropriate if fields in both files are used to provide the logic for coupling the files; the latter is appropriate for linkages which are not represented by fields in the records (e.g., Codasyl owner-member linkages).

If the DBMS has a subschema or logical data base capability, there should be simple, intelligible rules covering an application program whose view of the data base encompasses only one of a pair of linked files.

Desirable, but not necessary, aspects of interfile record relations include:

- The ability to couple and uncouple two files without having to unload and reload them.
- The ability to have application programs use two files while they are being linked or unlinked.
- The ability to link two files on subsets of all the records in the files. (This can greatly reduce the overhead in maintaining the linking pointers or tables.)

Record Storage

The criteria for record storage is deceptively simple. Certainly a DBMS should be able to store records. Isam stores records, Bdam stores records, Qsam stores records. What should a DBMS do that a simple access method doesn't do?

First, let me state that I view the only necessary DBMS capability as simply the ability to store records so they can be efficiently retreived. Desirable are the following:

- Ability for the DBMS to handle different rules for record storage for different files. For example, IMS offers a plethora (arguably, too many) of options for record storage.
- The establishment and retransmittal to the application program of the address where a record can be found. Such an address might be as direct as a disk address or as indirect as a relative record number, internal sequence number or page and line number. All of the preceding are easily translatable to a disk address (like a simple table link-up).

Since write-only data bases are not particularly useful, the DBMS should provide capabilities to retrieve records via all of the mechanism below which are "appropriate" for the DBMS:

- Retrieval of records by a disk order.
- Retrieval of records in at least one logical sequence.
- Retrieval of records by intrafile relationship.
- Retrieval of records in one file that are related to a given record in another file.
- Retrieval of records by a disk address or a logical address.
- Retrieval of records by a field value that has been used in the record placement (i.e., through randomizing or sequential placement.)

As with subsequent columns in this series, I would welcome additions, deletions and modifications to the criteria discussed here, but please provide a commentary with each suggested change.

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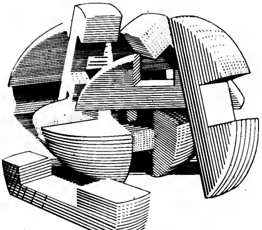

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In New Wave of Global Offerings

RCA Packet Service to Aid Smaller User

By Ronald A. Frank
CW Staff

NEW YORK — When RCA begins an X.25 packet service in about a month, it will signal the start of a new type of data offering designed for the smaller user.

Tentatively called Remote Global Computer Access Service (RGCAS), the offering will be priced at about $21/hour, which makes it considerably cheaper than existing data services offered by the international record carriers (IRC), according to Paul Silverman, manager of data services marketing at RCA Global Communications, Inc.

The final name of the service will be released when a tariff is filed with the Federal Communications Commission within the next few weeks.

Existing data services such as Datel cost $240/hour and the rates for switched network facilities are somewhat lower but still much higher than the new X.25 service, Silverman explained.

The RCA data service will be the first permanently tariffed offering to come out of a one-year experiment that has been conducted by the three major IRCs including RCA, ITT and Western Union International. Most of these interim services were authorized as a test to determine the demand for international public data offerings.

Analysis

Some industry sources looked on the interim services as the first indications of an organized effort by the IRCs and other carriers to eliminate private-line flat-rate services. These sources saw the X.25-type offerings based on volume-sensitive rates as a threat to major users of existing international private-line facilities. The international time-sharing firms were among those that perceived the data services as a threat to be blocked.

The opposition pointed out that although the interim services were designed to test user demand, the results showed limited interest. In fact, the interim offering drew mostly inbound traffic to the U.S. with virtually no outbound traffic to overseas points.

Proponents of the newer data services say there is a high demand for inbound-only traffic because the major hosts and data bases are located in the U.S. These sources believe that in time, multinational firms will establish data bases in Europe, the Far East and other worldwide points, and when that happens, the demand for outbound data services will increase.

Allows Limited Utilization

The RCA service is significant because it offers the smaller international user a service that allows limited utilization, according to Silverman. Rather than replacing the existing flat-rate services, he sees the RGCAS serving users who now are unable to afford the cost of overseas data links.

The RCA offering is also important in that it establishes the framework for interconnecting public packet networks from one country to another. Initially, it will not use the recently adopted X.75 protocol, but that will be implemented later, an RCA spokesman said.

RGCAS will allow users to transmit at 2,400, 4,800 and 9,600 bit/sec, using the X.25 packet-switching protocol. Initially, RCA will accept traffic from Tymnet and Telenet users in the U.S. to connect with the EPSS packet-switch network of the British Post Office (BPO). Interconnection with other packet nets such as Transpac in France will follow.

Smart CRTs Help Firm Tackle Tailored Savings & Loan Work

FRESNO, Calif. — A savings and loan computer services company here is using intelligent CRT terminals to implement client-tailored program improvements and to send critical program changes to remote client teller-operators within minutes after those changes are completed.

Reportedly one of the largest companies of its kind, Gesco Corp. provides on-line, real-time transaction and bookkeeping DP services to its parent institution, Guarantee Savings and Loan, as well as to 14 other nonaffiliated savings and loan associations in California, Colorado, Nevada and Oregon.

Using an IBM 370/158 mainframe, soon to be joined by a second CPU, and a network of client-resident intelligent teller-terminal systems, modems and leased communications lines, the company processes and transmits a full range of period financial reports to clients and gives special-report generation and data-base access privileges on an as-needed, real-time basis.

"Both in our regular periodic reporting and in our real-time custom-report service, called Gesco Management Information Service (GMIS), we strive to give the client wide report flexibility while at the same time keeping accuracy high and response time fast," marketing manager Chuck Yeates

(Continued on Page 74)

AT&T Data Net Debut Near?

By Ronald A. Frank
CW Staff

NEWTON, Mass. — AT&T appears ready to announce its full-service data network which could move the telephone company squarely into the teleprocessing area if the necessary regulatory approvals are granted by the Federal Communications Commission.

Reports persist that AT&T plans call for a mid-year unveiling of the Advanced Communications System (ACS) previously called the Bell Data Network.

Although the name of the offering may change again, details of the network service are coming from several sources that claim to have firsthand knowledge of the service. Reportedly AT&T will characterize the service as a turnkey offering for larger data network users, and some of these potential customers have been given previews of the service, industry sources report.

Analysis

It is not clear whether ACS will be offered as an alternative to large private-line nets,

(Continued on Page 72)

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AT&T Close to Announcement of ACS Net

(Continued from Page 71)

but apparently AT&T will include the capability to provide network diagnostics as part of its turnkey capabilities, according to consultant Dr. Dixon Doll. This would be important to larger users who have invested large sums in in-house technical control centers, he added.

AT&T personnel reportedly are being trained in the sales aspects of the new network so that the management aspects of the service can be stressed to potential users soon after it is announced.

Speculation on Protocols

In a recent seminar in New York, James Martin predicted that one of the ACS access protocols will be X.25. If Martin is correct, It is unlikely that ACS would implement its X.25 capability through the Decnet communications software available from Digital Equipment Corp.

DEC is currently testing the compatibility of its Decnet structure with the Canadian Datapac network and this type of an interface would be some months off if it proves to be technically practical, according to a source at DEC.

But Bell Labs is known to be a user of DEC hardware and Bell has the capability to develop the necessary X.25 or other protocol software for DEC or any other processors that will be used in the ACS network.

One of the key questions about ACS is whether it will be compatible with IBM's Systems Network Architecture (SNA). But Doll believes that neither IBM nor AT&T is interested in making its systems too interchangeable. Up to now, IBM has made limited X.25 RPQ announcements for 3270 CRTs operating under SNA and Series/1 CPUs. Neither of these products is available in the U.S., and it is possible that IBM wants to see whether ACS embraces X.25 before it decides how far to go with an X.25 capability for its users.

Most sources now believe that ACS is scheduled for a June introduction. Some believe Bell will have full-scale press conferences to coincide with the filing of its ACS tariff. As another possibility, AT&T may merely file the tariff without a formal announcement.

Whether IBM will intervene to object to ACS before the FCC acts will depend on how much DP-type capability is included.

Teller Terminal Handles Range Of Transactions

DAYTON, Ohio — NCR Corp. has announced an electronic teller terminal for financial institutions which reportedly can handle most transactions at teller windows, including the printing of passbooks, ledger cards and other inserted documents.

The microprocessor-based NCR 2251 complements the current line of NCR terminal systems for financial institutions and can operate as a free-standing system or can be upgraded for on-line communications and data-capture capabilities at a later date, according to a company spokesman.

Programs tailoring the terminal's functions to the specific requirements of both commercial banks and thrift institutions can be entered using the terminal keyboard. If the terminal is on-line, the programs can be loaded through a CPU or cassette unit, the spokesman said.

In addition to standard teller-transaction functions provided by free-standing terminals, the 2251 calculates interest as a by-product of normal transaction processing.

The inserted-forms station used for passbooks and printing on various inserted documents includes a 90-column matrix printer.

The terminal is priced at $6,950.

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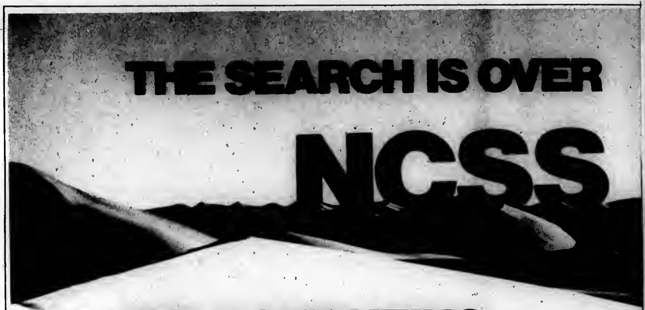

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At best, you now find yourself trying to find a system that will solve just some of your problems. You're willing to compromise on the other problems. And, in the end, you'll settle for some kind of a system you can call your own.

Perkin-Elmer Debuts Include CRT/Printer Duo

RANDOLPH, N.J. — Perkin-Elmer Corp. has announced four items including a CRT/printer configuration which it claimed offers a better price/performance ratio than previous systems. The combination package includes a Model 1100 CRT and 100 char./sec Model 650 Pussycat CRT page printer or a Model Owl-1200 CRT.

In addition, the firm announced a double-buffering option to allow older CRTs with unbuffered printer ports to use its Model 650 page printer, seven international character sets and an acoustic coupler for use with the Model 1100 and Owl-1200 CRTS.

The character sets are adaptable to the firm's Model 650 page printer, a spokesman noted.

When printing is requested of the CRT/printer package, the Model 650 printer sets the Model 1100 free to resume dialogue with the host after 2 sec because of its full page buffer and 9,600 bit/sec transfer rate, according to the company.

The package allows the operator to print only summary results rather than wasting paper for messages to and from the host computer, the firm said. There are no fans in either the CRT or printer.

For those desiring extensive editing, block transmission and form drawing, the package is available with the Owl-1200 instead of the Model 1100. The forms-drawing set for the Owl-1200 and Model 650 consists of 31 linear, intersection and special monetary system symbols that can be used to depict bar graphs and commercial forms, according to the company.

The 650 printer can also print the CRT inverse video fields for generating elaborate forms and bar graphs.

The optional second buffer for older CRTs allows the Model 650 page printer to accept a continuous stream of data, printing one page of screen information while storing the next, the firm said.

Many of the older CRTs have a "wye" connection between the communication line and printer terminal instead of buffered CRT printer ports, the spokesman said. To print a CRT screen, the information is returned to the host and retransmitted with a printer line control character.

Messages are typically saved in the host and printed at the end of the session, making it necessary for the printer to accept a continuous stream of several screens full of data, the spokesman added.

The seven character sets announced include British, Germany, French, Danish/Norwegian, Swedish, Spanish and Cyrillic languages.

The Model 50 acoustic coupler draws its power from the CRT terminals by the same cable used for data, eliminating the need for a separate power supply, the firm said. The coupler operates at 300 bit/sec.

The CRT/printer package including the Model 1100 CRT and Model 650 Pussycat page printer costs $2,795. The price for the package with the Owl-1200 CRT instead of the Model 1100 is $3,695.

The second buffer option is priced at $150. The basic Model 650 page printer lists at $1,262. International character sets are available for $100. The Model 50 acoustic coupler sells for $365.

Perkin-Elmer Corp. is located at Randolph Park West, Rt. 10 & Emery Ave., Randolph, N.J. 07801.

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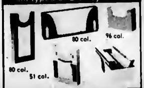

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Smart CRTs Help Service Tackle Finance Work

(Continued from Page 71)

said.

"Not only do we constantly improve and upgrade all programs that make regular, periodic use of the client's five master files — savings accounts, real-estate loans, collection accounts, consumer loans and general ledger — we also have to respond quickly to legislative changes with appropriate programming changes or new programs, since savings and loan institutions must adhere to new regulations within the legal time limits.

"Furthermore, we offer clients a report-generation service that lets them create and format any kind of special report they need, then transmit it to us for immediate, real-time production," Yeates said.

"We currently control nearly two million individual master accounts and we stay on top of all of them by maintaining close personal contact with our clients as well as keeping records up-to-date and fully accurate," he said.

Gesco's 15 savings and loan clients — many with multiple branch offices — use a variety of self-selected intelligent terminal systems and leased communications lines of 1,200, 2,400, 4,800 and 9,600 bit/sec to access the Fresno 370/158 master files. Among those terminal systems are PTS-100 from Raytheon Data Systems Co.

Gesco also uses the PTS-100s for internal program development and modification work. The terminals are located in the company's programmer "testing room," and are in direct communication with the 370.

"With programmable terminals, the savings and loan association gets greater response and flexibility because we, the ones who actually perform that programming, can better adapt system changes to the clients' needs," according to Laird Gilbert, technical adviser at Gesco. "It allows us to make program improvements at both ends of the phone line, not just at the host.

"In fact, the Raytheon terminal's flexibility, in terms of user programming, programmable keyboard features and remote program load capability, represented our first selection criterion," Gilbert said.

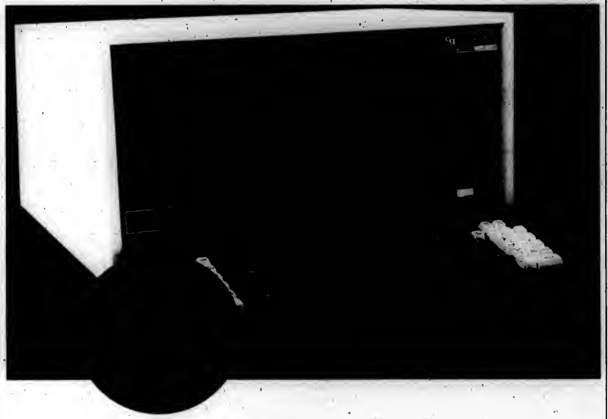
"After that, we chose the PTS-100s for their availability, reliability and cost advantages," he said. "Reliability is especially important for our development work, because we can't be hindered by any problems in the terminal systems we use.

"We put the terminals' programmability to use when we created GMIS. To produce and request such a report, the client uses the terminal's CRT screen to create the report format most appropriate for the job at hand," Gilbert explained. Gesco previously programmed the parameters for the custom report format and also programmed error-checking mechanisms into the formatting program that can catch errors as they are input. As a result, the firm has control over data accuracy because of its checking programs, but the client also has control over the report format, the technical adviser noted.

Once the report is formatted, it is transmitted to Gesco's 370/158 via leased lines. The report request can access information from any or all of the client's master files and is completed and returned to the client in minutes, he added.

Remote program loading facilitates sending regular program updates and noncritical new programs to clients as well, Gilbert said, because the client can work interactively with Gesco to make sure the program is correct.

Without this capability, any additional program changes involve extra transportation and time delays between the client and Gesco. Remote program loading and terminal programmability in general enable the Gesco-client relationship to "improve with age" by letting Gesco make continual refinements and improvements in the client's system in a day-to-day working environment, he said.



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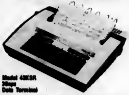

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West Coast Office: NEC Information Systems, Inc., Marty Rubin, 8939 S. Sepulveda Blvd., Suite 330, Los Angeles, California 90045 (213) 670-7346.

System Tracking Tickets for Busy County Court

MINNEAPOLIS — The Hennepin County Court here has earned a national reputation for administrative and judicial efficiency. Contributing to that reputation is a terminal-based system that tracks court citations from violation to disposition, saving time for the court, trouble for the offender and dollars for the taxpayer.

This year, the system will handle nearly half a million court citations, mostly for traffic offenses but also for ordinance violations and criminal misdemeanors. It provides important advantages now and promises even greater benefits in the near future, according to S. Allen Friedman, court administrator.

"Hennepin County Court serves more than a million citizens in Minneapolis and some 50 suburban communities and ranks among the busiest limited jurisdiction courts in the nation," Friedman noted. "Without the citation-tracking and fine-processing system, we would be swamped with paperwork and would require many more clerks to handle the mounting caseloads."

Time and money savings already realized from the recently implemented system have been substantial, and traffic citation processing is now far more accurate and efficient, according to Friedman. These early benefits will multiply when the computer-compiled and maintained traffic violations file is put on-line for inquiry purposes and for swift transfer to and from the state-maintained motor vehicle records departments, he added.

The traffic citation processing system shares time on the county's IBM 370/168 mainframe. It utilizes two terminals initially developed for the banking business. These are the IBM 3604 data communications and the 3612 document processor units, which work in tandem to enter violations and fine payment data and to validate tickets and related documents.

Ten Stations

Currently, Hennepin County Court has 10 of the dual-terminal stations in operation. Six of these stations are located within the Government Center in downtown Minneapolis, and four of the stations are located remotely in outlying municipal court division offices.

Citation and disposition information is entered daily via the terminals and stored on a diskette transaction record, which is later processed in batch mode to update the computer-controlled traffic citation files.

The traffic citation system, serving Hennepin County's Traffic Court and Violations Bureau, provides essentially "cradle-to-grave" control over tens of thousands of multipurpose citations issued by more than 50 law enforcement agencies throughout the county. The majority of these involve traffic offenders, but citations are also issued for health, fire and building code violations and for such misdemeanors as shoplifting.

"Actually, computer control over citations begins with the printing of the tickets," according to LaGretta Dean, Hennepin County Court's system analyst. "Every ticket number is recorded on the file, and the record is updated as blank ticket blocks are assigned to the various municipalities and as the municipality assigns ticket batches to individual police officers at the precinct level. Every blank citation printed is thus accounted for, and we always know who has which tickets."

Citation tracking starts when the police officer writes a ticket, copies of which go to the Violations Bureau and to the DP department. In the DP department, CRTs are used to immediately enter the ticket number, the violation code and date of violation, the community and officer identity numbers, the location of the violation, the license number of the vehicle, the make and model of the vehicle and, if available, the name and address of the violator and his driver's license number.

All of this information is set up on the violations master file by ticket number. At any one time, there will be more than 125,000 violations records on the file, according to Dean.

"The system not only maintains the violations records, it also processes those records on a monthly basis to note overdue fine payments and trigger a summons report," she explained.

As fines are paid by the violators (about 85% by mail), the terminal stations once again come into play. A clerk uses the terminal to enter disposition information.

The programmed terminal assigns a transaction number, and the document processor is then used to validate the disposition data on the back of the returned ticket and on the violator's payment check.

This citation disposition entry eliminates the affected record on the violations file and creates a record on the dispositions file. The latter is maintained by transaction number and includes the date and amount of payment and the number of the ticket, plus the community and clerk codes for audit trail purposes.

Working with the dispositions file data, the system creates daily cash collection reports and also the monthly cash collection report used to disburse collections to the appropriate municipalities.

By taking full advantage of computer capabilities, the court has been able to cope with mounting caseloads without any increase in court staff, Friedman noted.

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Dissolves Punch-Card Bottleneck

Key-to-Disk Speeds Bank's Data Entry

Special to CW

HYATTSVILLE, Md. — Suburban Trust Co., noting that data entry is the most labor-intensive operation in its large-scale DP operation, claims a high level of efficiency using 15 key-to-disk systems to capture a large volume of daily transactions.

The transactions include installment, real estate and commercial loans, trust information and payroll data.

As recently as two years ago, Suburban Trust's data entry work was handled on punch-card equipment alone. But as a result of rapid growth, the bank started to develop a bottleneck in its data entry operations.

"The old arrangement simply couldn't handle our increased demands," Bob Wienecke, senior DP officer at Suburban Trust, observed. The bank then turned to a Pertec Computer Corp. CMC Division CMC 5 Keyprocessing system, with a resulting savings of both time and money, he said.

Suburban's system has a number of operator-controlled CRT keystations linked to a central minicomputer console that handles all system control functions, data format control and error and verification procedures. The operators key information from source documents while the system's resident disk memory captures all the data.

As a distributed data entry system, the CMC 5 performs error control, verification and other functions on the data as it is keyed. Verification and correction can be immediate, whereas with keypunching equipment, errors are caught further down the line in a subsequent verification process. From the disk, the corrected, formatted data is moved onto magnetic tape for later use in a computer run, he explained.

One of the major advantages of the CMC 5 is that it eliminated the need for Suburban Trust to transport bookkeeping data physi-

(Continued on Page 80)

Users Advised to Shape Plans Slowly

By a CW Staff Writer

NEW ORLEANS — Long-range planning is an important function of the DP manager, but two big roadblocks stand in the way. First, most people don't know how to put a long-range DP plan together; and second, it isn't clear what to do once such a plan is made up, according to Benjamin R.W. Knowles, vice-president of Brandon Systems Institute, Inc.

Addressing a session of the Federation of NCR Users (FNU) convention (Nucon:78) here, Knowles explained two reasons for progressing slowly with a long-range DP plan.

The process for creating a long-range plan must identify the most critical planning issues, determine feasible courses of action and support the plan with adequate documentation to get senior management support, he said.

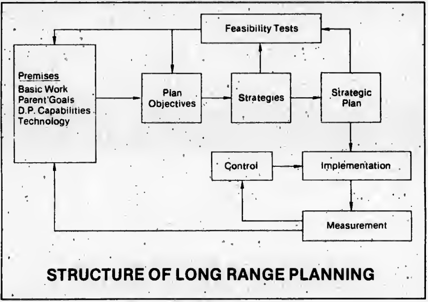
Knowles proposed seven elements in the process (Fig. 1):

- Premises and issue selection — the assessment and problem identification element.
- Objective setting — the "what by when" element.
- Strategy development and selection — the "how" element.
- Consolidation into a strategic plan — the total-impact-on-budget element.
- Feasibility tests — the correction element.
- Implementation and control — the tie to annual planning.
- Measurement — the feedback element.

The identification of long-range planning issues is done in four steps, Knowles explained. First, trends covering workload growth are documented.

Second, changes in company policy and direction must be identified.

Future budget availability for DP activities should be discussed with senior management.



STRUCTURE OF LONG RANGE PLANNING

Figure 1

Third, DP management must determine whether there are desirable changes to methods of managing the DP department. Trends in budget use and personnel levels should be assessed.

Fourth, technological opportunities are evaluated.

"In the more 'how-to-do-it' sense, premises are studies," Knowles said. "The studies represent the data gathering and analysis stages in early planning. There is no unique standard for the form of the studies, nor is there a standard set of issues which a DP department must evaluate."

The four steps Knowles discussed will reveal a variety of potential problems and opportunities to be included in the plan, he said. Further, the DP management team will need to reduce the total number of potential issues to between three and 10. In early plans, the number of issues must be even smaller, perhaps only three, he suggested.

As a "motto," the planner must stress achievement of a few important goals rather than risk failure because of fragmented management attention, he stressed.

The objective development step is basically to convert the selected issues into meaningful statements which describe the intended result desired by the planner in terms of a change in a measurable variable. The step

(Continued on Page 82)

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Instead of Beefing Up System

User Boosts DP by Leasing CPU Components

By Robert J. Ehlers
Special to CW

SAN BERNARDINO, Calif. — When the Southern California Mortgage and Loan Corp. first started processing data, it started with a 32K NCR Corp. Centrury 100. Now, several years later, the firm is still an NCR shop, using a 128K Century 201 linked to components of a 192K Criterion 8550.

Following the installation of the Century 100, business grew and applications proliferated; more CPU memory was installed. The Century 201 was installed after upward migration through two successively more powerful CPUs from NCR.

All too soon, however, the DP center was again back to working three shifts a day, seven days a week. Increasing the CPU memory to 512K would have been some help, but it also would have been relatively expensive. Another option would have been to install another, more powerful computer system.

Economics and a desire for system backup dictated the choice of a third course. Since there was a substantial lease equity in the 201 CPU, it was purchased. Then, for nearly the same monthly rental it would have cost to beef up the 201, the company leased components of a 192K NCR Criterion 8550 system.

Interconnected to the two CPUs are two tape drives, eight drawers of magnetic disk which put nearly 400 million bytes of information on-line at a time, punched card readers rated at 300- and 600 card/min and printers rated at 1,500- and 2,000 line/min. If any portion of the system goes down, the work can quickly be shifted to another segment.

Third Shift Eliminated

One immediate result of this greatly expanded capability was elimination of the third shift. Moreover, there is built-in capacity for expansion, which should handle the needs of the company for a minimum of five years and probably more.

The two CPUs use the same programs; no costly conversion was required. Through the use of floppy disk firmware, the 8550 performs as if it were another, more powerful 201.

The dual system provides multiprogramming capability for handling up to five processing operations at a time. This, too, is important because the company already has extensive on-line applications and plans more.

In the loan servicing department here, there are eight NCR CRT terminals. Four are equipped with thermal printers for producing hard copy whenever needed.

Immediate Answers

The on-line terminals permit questions from mortgage holders to be answered immediately. Formerly, up to 2,000 such replies a day had to be produced by line printer. Now that burden has been eliminated and customer service has been greatly improved.

The tax and insurance departments also make file inquiries, as does the loan transfer department.

There are on-line thermal keyboard send/receive typewriters located at the branch servicing offices in Washington, D.C., Denver, Phoenix and Honolulu.

At the company's headquarters in Newport Beach, Calif., an NCR thermal printer with dual tape cassettes serves two functions. It provides online inquiry capability for executives and the mortgage document shipping department, and it provides for offline preparation of input data that can be transmitted to the remote computer center by telephone during slack hours.

The first DP applications at Western Pacific Financial involved loan servicing, and those still account for about 60% of the workload. But the library of 600 programs now embraces financial control, shipping and marketing, with even more to come in the latter two areas.

Once thing the company wants to do, for example, is develop better tools for measuring performance. One branch may produce $5 million in new mortgages while another is producing $20 million. Does that mean the second is $15 million more productive on a similar cost basis? Not necessarily, because the sizes of mortgages vary widely from on part of the country to another.

The first branch, therefore, might have worked even harder than the second branch. Thus, although a higher mortgage does bring in more loan servicing income, all other things being equal, the company wants to relate branch costs to production by units as well as by dollars.

Productivity Tracked

The primary guideline for DP at Western Pacific Financial is flexibility, for management feels the computer is ideally suited to serve several goals. One, of course, is to improve productivity — and hence reduce or at least inhibit the growth of operating costs — through the automation of paperwork.

To that end, the computer keeps track of each stage of business, from the generation of a mortgage in the field

(Continued on Page 81)

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Command Center of Johnson Space Complex

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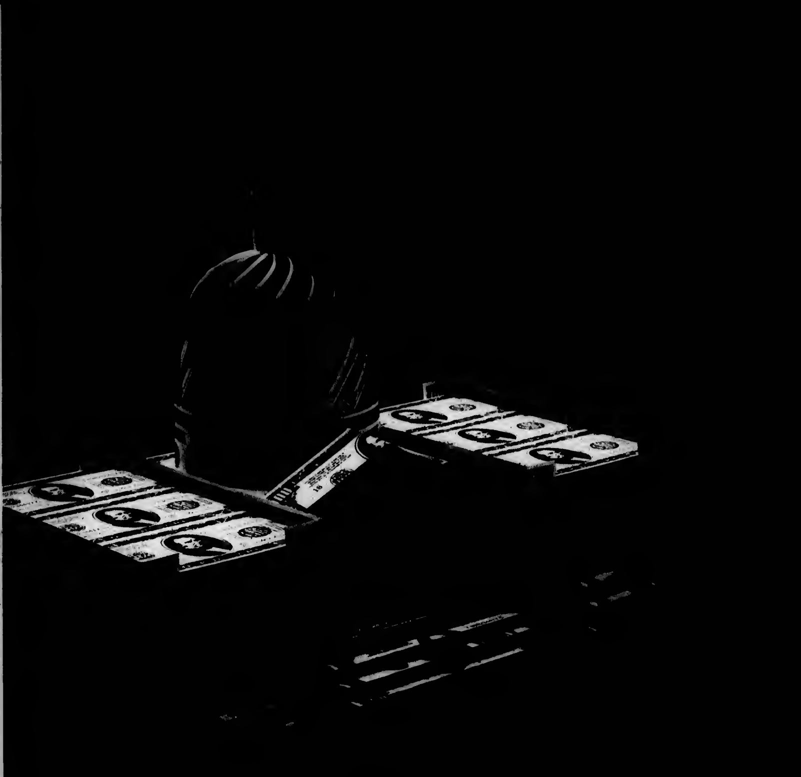

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Key-to-Disk Breaks Up Bank's Data Bottleneck

Data Entry Dimensions

(Continued from Page 77)

cally to a main computer for conversion to magnetic tape. The bookkeeping department data was being keyed into an IBM 3741 data entry station and recorded on its diskette.

"But the bookkeeping department was not only a good distance away from our main computer, an IBM 370/158, Wienecke said, "it was also separated from the other data entry sources."

The diskettes containing source data input had to be hand-carried to the bank's computer room for conversion to magnetic tape, a procedure that had the net effect of slowing down bank operations. "The effectiveness of our operators was impaired," Wienecke explained, "since they also had to be the messengers."

Error Correction

Use of the CMC 5 also helped Suburban Trust in error detection and correction. "Previously," Wienecke said, "we might lose hours of work because a series of errors could go undetected during entry." Wienecke also said that the system's capability to later correct formatting errors made during keying had the effect of speeding up the whole data entry process.

As a result, Suburban Trust sharply improved its overall data entry operations. "First and foremost," Wienecke said, "we were able to create an integrated distributed data entry system which permits us to solve source data problems using a systems approach, rather than having to deal with them using isolated pieces of hardware."

The problem of bookkeeping entries being hand-carried for conversion was eliminated automatically, since the system allowed the bank to install keystations as far as 2,000 feet from the system's control console.

With input direct to disk, format errors, once incorrectable, were also easily handled by the CMC 5 to the bank's satisfaction: "We can use the equipment to take three columns of data formatted 'ABC,' for example, and reformat the data 'BCA' or any other way we want," Wienecke continued. "We are very pleased with the flexibility the CMC 5 offers us."

According to Wienecke, overall throughput has risen sharply, since the system lets the bank's keystation operators add constant data such as header dates, codes and transit numbers to records without keying in each character of data. Various management information reports, such as operator performance statistics, are provided to the bank via an integral line printer tied to the system.

"Now we're adding refinements to the CMC 5," Wienecke said. "We've just ordered the data validation feature, disk storage to hold up to 200,000 records and Program Language/Edit (PL/E), which will give us real-time tests and displayed messages to help our operatots. The system is growing with our needs."

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A state-of-the-art computer like the 303X needs a state-of-the-art impact line printer

User Boosts Capacity by Leasing Components

(Continued from Page 78)

until it is sold and then on through servicing. The last function can be spread over 30 years, although the life of the typical mortgage is less than 12 years.

In a similar fashion, the computer is used for the daily trust accounting and report generation for the company's escrow subsidiary. It also keeps the books for joint-venture construction projects, comparing expenses with budgetary limits and refusing to issue payment vouchers without approval.

But management wants to increasingly use the computer in more sophisticated ways. That, in essence, means using the existing data base to extract meaningful information and to do so in a timely fashion.

Back in the days of tight money, when the prime rate soared to 12% while mortgages were selling for only 9% to 10% because of California usuary laws, the computer enabled Western Pacific Finance to turn its loan warehouse around quickly. That helped minimize the impact of the adverse 2% to 3% interest spread and kept increasing the loan servicing base, which permitted the company to ride out the crunch.

More recently, the computer has been invaluable in putting together loan pools ranging from $1 million to $15 million in Government National Mortgage Association (GNMA) certificates for sale to institutional investors. Veterans Administration and Federal Housing Administration loans account for more than 80% of Western Pacific Financial's new business, and most of them have been sold in GNMA pools this past year or so. Currently, in fact, the company is servicing $700 million in 151 GNMA pools.

The computer can assemble such pools efficiently and can select the components to satisfy virtually any specifications.

Conversely, however, if there is a sudden shift in the market, as there was in June 1977, the computer enables Western Pacific to focus selling efforts on whole loans.

Ehlers is a senior vice-president and manager of DP at Western Pacific Financial Corp.

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Digital Systems' Reader/Punch Fits Teletype 43

MONROEVILLE, Pa. — The Digital Systems Corp. has introduced a 30 char./sec tape reader/punch that has been integrated with the Teletype Corp. Model 43 teletypewriter.

The unit features a heavy-duty combination reader and "Mylar-rated" punch in a desktop enclosure that contains a power supply and interface electronics. The punch/reader is interfaced through an RS-232 communications port, which reportedly allows the terminal to be used on remote time-sharing applications. The unit can also be used alone for tape duplication and editing, the firm claimed.

Standard controls include reader/punch, start/stop and single step. Full remote software control of the unit at both 110 bit/sec and 300 bit/-sec is standard, according to the firm.

A reader/punch unit, including Teletype Model 43 costs $2,795 from the firm at 223 Monroeville Mall, Monroeville, Pa. 15146.

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Take Long-Range Plans Slowly, Users Advised

(Continued from Page 77)

also limits the time of accomplishing a specific change, he added, "Simply stated, the objective states *what* will change by when," Knowles explained.

At this point, many issues have been prioritized and some have been eliminated, he said, but no clear statement has been made about what result the DP management team intends to accomplish and how the team expects performance to be measured, not when the intended result will be measurable.

Long-range planning details according to Knowles, should include:

- What level of hardware capacity is targeted for each year.
- When major technology will be available.
- What critical user areas will be addressed with new systems by when.
- What changes are to be made in the performance of the DP.

The next element in the structure is the development of alternative strategies for each objective and the selection of the most desirable strategy. Knowles defined a strategy as a proposal describing how DP resources will be used to accomplish an objective. The objective deals with the people, machines, money and schedules of events which will cause the desired change (Fig. 2).

Master Schedule

For each planning year, the events described in each of the strategies must be combined into a "master event schedule" and the total department resource requirements must be combined to create a "master resource budget," Knowles explained. The merging of resources for change and resources for ongoing activities creates a proforma budget extending from the current budget year throughout the planning horizon.

The feasibility test element in the planning structure doesn't represent a separate step in the process. Instead, it highlights the kinds of reviews which must be made in strategy planning in order to assure that the plan is developing in a practical manner.

Once the plan has been finalized, the first real test of its workability is whether the first year is budgeted. The "best laid" plans are worthless if resources are not available to implement the events on schedule.

As soon as a budget is approved, the first events can be assigned. If no followup is done, it is likely that little of the plan will ever be achieved. A measurement step is needed, Knowles advised.

Measurement of task performance must determine whether the assigned tasks are being completed satisfactorily. If not, redirection of day-to-day activity is necessary to "get back on target," he said.

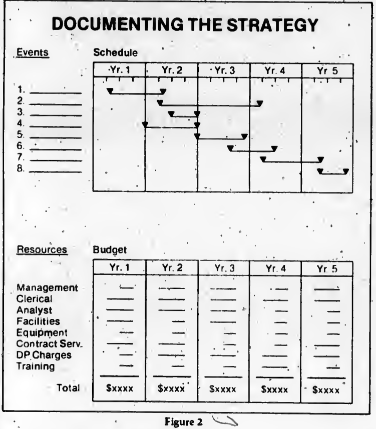

Figure 2

Proposal Book Rocks Industry!

A California publishing firm has literally taken the computer industry by storm with a recently-published "how-to" proposal book. The book, a 4 . pound loose-leaf volume entitled *How to Create a Winning Proposal*, covers every aspect of proposal preparation from start to finish, including the nuts-and-bolts details on how a winner is put together

Written by two top West Coast proposal consultants, *Winning Proposal* is rapidly becoming the standard text for use in commercial, government and OEM proposal efforts It is currently in use by 74% of the major data communications equipment manufacturers in the nation and 58% of the EDP management and service organizations

Using a step-by-step instructional technique, the authors provide a virtual roadmap to the entire proposal process including section-by-section checklists to ensure the proposal team of covering all the important bases. Excellent guidelines are given on the contents, structure and methods of preparation for both solicited and unsolicited proposals. A tactical approach is used for developing an effective "win strategy," mobilizing the proposal team, and controlling the input of the various team members Detailed instructions on how to analyze and respond to RFP's RFQ's, and IFB's are included.

Copies are available from Mercury Communications Corp., 730-CW Mission Street, Santa Cruz, CA 95060 $65 (pre-paid) includes 3-5 day delivery inside USA In Calif add $3 90 For outside USA, U S. $76 (Int'l money order) includes air delivery To order C O D call 408/425-8444

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High- and Low-End Systems

HIS Level 6 Family Gains Two Members

By Jeffry Beeler
CW Staff

BILLERICA, Mass. — High- and low-end systems have joined the Honeywell Information Systems, Inc. line of Series 60 Level 6 minicomputers.

Both additions preserve compatibility with the other four members of the Level 6 family, according to HIS spokesmen. They also interface with IBM 370s, Memorex Corp. 1270s and other host mainframes, the officials added.

The HIS introductions include the low-end Model 23 — a "diskette-based, communications-oriented" system — and the high-end Model 57, a "Cobol-oriented" machine to which users can reportedly upgrade from the four earlier members of the Level 6 line.

At the same time, HIS introduced three other Level 6 products — a VIP 7801 CRT terminal, a MOD 200 executive for the Gcos 6 operating system and the DIU 9100 series of diskette drive units.

The MOD 200, an entry-level executive, permits users of the Model 23 to perform on-line transaction processing in multiterminal systems, the HIS spokesmen said. The DIU 9100 series consists of four diskette systems ranging from a 256K-byte, single-drive model to a 1M-byte, dual-drive version.

The Model 23, comparable to the low-end systems in Data General Corp.'s Nova series, reportedly executes 200,000 instruction/sec and provides roughly 60% of the processing power of a Model 33, the next largest member of the Level 6 family.

HIS Level 6 Model 23

The entry-level system also comes with the same 108 instructions and internal register organization as the larger Level 6 models, the officials said. As a result, the Model 23 can operate with both Gcos 6 MOD 200 and MOD 400, the same software used by the Model 33, the spokesmen explained.

This software compatibility is said to allow the system to accommodate Fortran and RPG as well as entry-level and intermediate Cobol.

HIS intends the Model 23 primarily for OEMs, systems houses and commercial end users that will buy at least four of the processors. In a typical application, the system can serve as an on-line processor or multifunction terminal in distributed processing networks, company officials said.

The Model 57, by contrast, compares roughly in performance to Digital Equipment Corp.'s PDP-11/70 and executes 700,000 instruction/sec, HIS said. Like its smaller predecessor — the "commercially oriented" Model 47 — the top-of-the-line system reportedly incorporates two processors.

(Continued on Page 89)

First-Timer's DP Net Boosts Output Tenfold

ROCHESTER, N.Y. — Productivity in the purchasing department of the city school district here has reportedly jumped tenfold since the department automated its clerical functions with its first minicomputer-based "distributed processing network."

During the system's first two months of operation, two operators produced 900 more documents than three unassisted clerks did during the same period last year, according to Thomas C. Iaia, supervisor of the purchasing department's purchases and stores,

Iaia, whose staff must generate documentation for 40,000 requisitions each year, acquired the on-line system to maintain inventory listings and produce reports for the 6,000 vendors that supply the city school district with everything from paper clips to buildings. The system also generates 25,000 purchase orders per year and helps the department, which must open all purchases of more than $1,500 to competitive bidding, prepare 400 quotation requests annually, Iaia said.

Before they acquired the automated network, Iaia and his staff performed most of their purchasing functions with the aid of a manual card filing system. Then in 1964, they switched to a punched card/punched tape system that remained in service until last year.

Under the most recent system, Iaia's staff members recorded purchasing information with the punched card/punched tape machine and then reinserted the resulting tape to produce a typed purchase order. They later punched a second tape from which they prepared purchase registers.

When a supplier subsequently filled one of the city school district's purchase orders, information describing the received item went onto a punched card whose two parts were stored in separate tub files, Iaia explained. One part of the card bore the handwritten date of the product's purchase order; the other

(Continued on Page 88)

Printer for Distributed DP Yields Up to 900 Line/Min

SAN ANTONIO, Texas — Datapoint Corp. has expanded its line printer family with the introduction of a variable-speed unit that the company said suits distributed processing applications.

The printer comes in two versions — the Model 9265, which outputs 64 upper case characters only at 900 line/min, and the Model 9266, which prints 96 upper and lower case characters at 660 line/min. Both versions use an anvil impact printing technique with a rotating drum.

The printer generates an original and up to five copies on fan-folded, edge-punched paper 4- to 19 in. wide, a spokesman said. Slewing paper at 130 in./sec, the unit prints 136 char./line with either 6- or 8 line/in., he noted.

The printer reportedly comes fully buffered and attaches to the I/O bus of any Datapoint processor except the company's Model 1500.

The Model 9265 costs $28,230 and leases for $785/mo on a three-year contract, while the Model 9266 sells for $30,670 and leases for $854/mo for the same period.

Datapoint is located at 9725 Datapoint Drive, San Antonio, Texas 78284.

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IBM, DEC, DG Users Gain Double-Density Floppy

MOUNTAIN VIEW, Calif. — IBM compatibility is reportedly combined with single- and double-density recording capability in a floppy disk drive system and controller from Scientific Micro Systems, Inc. (SMS).

The FT series comes with a host interface processor (HIP) controller for Digital Equipment Corp. and Data General Corp. minicomputers, according to SMS officials, who described the HIP as an intelligent direct memory access controller that boosts system throughput by offloading a CPU from disk I/O processing.

Capable of storing 2.5M bytes, the dual-head disk units function with computer-assisted tomography (CAT) scanners, image processing and display equipment, medical instruments, photocomposition systems, small business systems and other hardware requiring bulk storage, industry-standard media formats and high throughput, the spokesmen said.

The systems also come with two-drive expansion enclosures, they noted.

Prices for a two-drive system start at $3,700. Quantity discounts are available, SMS said from 777 E. Middlefield Road, Mountain View, Calif. 94043.

Three Interface Subsystems Offered for HP 2100, 21MX

ELGIN, Ill. — Both hardware and software are packaged together in three interface subsystems for the Hewlett-Packard Co. 2100 and 21MX series of minicomputers.

The Analytical Systems Corp. (ASC) 21000 line of interfaces consists of the Model 21101, a single-port asynchronous serial communications subsystem; the Model 21201, a parallel interface subsystem; and the Model 21301, an analog data acquisition subsystem.

The Model 21101 attaches to interactive hard-copy terminals, CRT terminals and line printers through Bell 103, 113 or 202 modems or their equivalents, according to ASC spokesmen.

The subsystem transmits at 50- to 19.2k bit/sec, accommodates 5- to 8-bit words and provides three stop-bit lengths, the officials added.

The Model 21201 reportedly interfaces with peripherals from Centronics Data Computer Corp., Control Data Corp., Data 100 Corp., Diablo Systems, Inc., Digital Equipment Corp., Lear Siegler, Inc., Okidata Corp., Versatec, Inc. and other vendors.

Capable of transferring data at up to 500k char./sec; the subsystem supports additional peripherals through controller switch selection and the assignment of an I/O subchannel, ASC spokesmen said.

The Model 21301 incorporates an intelligent controller, control memory and a 12-bit resolution analog-to-digital converter on one 8.67- by 7.75-in. interface board, the officials continued. The control memory holds 256 words by 16 bits of static Nmos storage and cycles in 2.4 microsec, while the firmware/state register-based controller cycles in 200 nsec, ASC said.

The models 21101, 21201 and 21301 cost $550, $975 and $3,675, respectively, from ASC at Box 533, Elgin, Ill. 60120.

Micos Rental Plan Includes Buy Option

ELMSFORD, N.Y. — Mini-Computer Systems, Inc. has announced a 12-month rental program with a purchase option for its Micos business computer systems.

With the program, users can rent a Micos system for $995/mo, including installation and maintenance, company officials said. Any time during the rental period, users have the option of buying the system and applying 50% of the rental payments against the system's $28,750 base purchase price.

Mini-Computer Systems is located at 525 Executive Blvd., Elmsford, N.Y. 10523.

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Mohawk Data Sciences announces System 21 50, the latest member of the Series 21 family of distributed processing systems.

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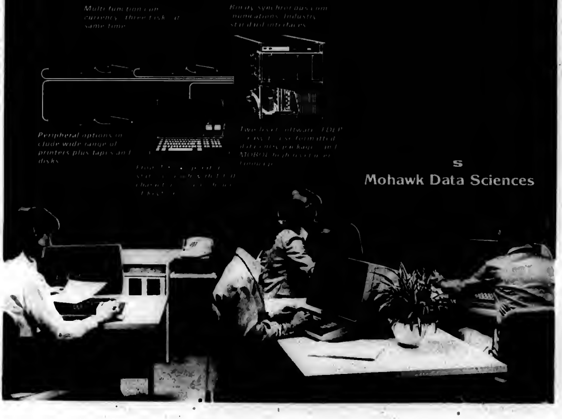
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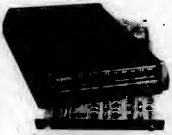

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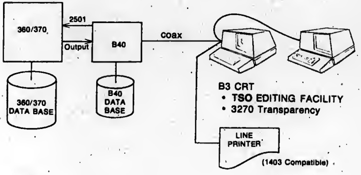

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Xebec Disk Emulates DEC Units

SANTA CLARA, Calif. — Both the Digital Equipment Corp. RK cartridge disk systems and the DEC RX floppy disk systems can reportedly be emulated by a disk storage system from Xebec Systems, Inc.

Designed to operate with both the LSI-11 and the PDP-11 series, the Soft Cartridge is also program-transparent with the RK and RX units, Xebec officials said.

With dual drives, the Soft Cartridge system stores 2.5M bytes, roughly the storage capacity of an RK-05, the spokesmen explained. With an optional two-drive expansion chassis, the system can grow to accommodate as much as 5M bytes, they added.

Thumbwheel switches are said to allow users to designate each of the system's drives as an RK or RX unit.

As an RX unit, each Soft Cartridge drive generates and reads DEC-format diskettes, interfaces to a host computer as a programmed I/O device and can pass the RX-11 interface diagnostic and RX-11 system reliability test, Xebec said.

Each drive operating as an RX unit generates and reads double-density format diskettes, interfaces to the host processor as a direct memory access device and operates under control of all RK-11 software drivers, the spokesmen added.

In both the RX-11 and RK-11 modes, the system is said to provide 77 recording tracks. In the RX-11 mode, however, the unit stores 256K byte/disk and provides 26 sector/track with 128 byte/sector.

By contrast, a system in the RK-11 mode holds 630 bytes on a single-sided diskette and provides 16 sector/track with 512 byte/sector, the officials noted.

When emulating both the RX-11 and the RK-11, the Soft Cartridge system reportedly rotates at 360 rev/min and comes with 48 recording track/in., they said. An RX-11 unit, however, records 3,200 bit/in., while an RK-11 device holds 6,400 bit/in.

Both the single- and double-sided versions of the Soft Cartridge reportedly provide 83 msec average rotational latency and 35 msec head load. A single-sided model accesses in an average of 260 msec with 8 msec track-to-track access and 8 msec settling, the officials noted.

A double-sided version, by contrast, accesses in an average of 91 msec with 3 msec track-to-track access and 15 msec settling, they added.

A two-drive, single-sided system costs $4,950 from Xebec at 2985 Kifer Road, Santa Clara, Calif. 95051.

Minicartridge Fits Same Purposes As 3M, HP Units

SUNNYVALE, Calif. — A mini-cartridge from Information Terminals Corp. (ITC) provides compatibility with the 3M Co. DC-100A and the Hewlett-Packard Co. 9162-0061 minicartridges, according to an ITC spokesman.

The Model TC-150 also operates with drive units from Candex Pacific, Instrumentation Technology Corp., Qantex and Texas Instruments, Inc., he added.

Equipped with a proprietary drive technology, the minicartridge is said to hold 140 ft of .150-in.-wide tape. Storage capacity depends on the user's data format, ITC explained.

Recording formats available with the minicartridge reportedly range from 800 bit/in. single-track to 1,600 bit/in. dual-track.

The Model TC-150 costs about $12 from ITC at 323 Soquel Way, Sunnyvale, Calif. 94086.

Unit Hastens Mini Plots

SANTA CLARA, Calif. — Overburdened minicomputers that control Versatec, Inc. electrostatic printers can reportedly cut their processing time eightfold with a unit that allows the minis to off-load vector-to-raster conversion.

Versatec's Vector-to-Raster Converter (VRC) also cuts minicomputer disk space requirements and I/O time 20-fold with a standard set of 256 active vectors expandable to 4,096, company officials claimed.

In addition, the VRC lets mini-based interactive graphics systems plot maps and drawings up to 6 ft wide and with up to 200 dot/in., they added.

Using a 56-bit microcode with a 100-bit-wide memory and a 275 nsec instruction cycle, the VRC's dedicated processor is said to convert as much as 1M byte/sec.

The 100-bit data path and the 56-bit microcode permit the unit's microprocessor to access a complete vector and to perform up to eight functions in one instruction cycle, the Versatec spokesmen said. Some of these functions incude arithmetic, logic, shift, rotate, branch and repeat.

The VRC's operation is supported by Versaplot-07 plotting software, a set of Fortran callable routines that are compatible with pen-plotter application programs, Versatec said.

The VRC unit costs $3,900 from the company at 2805 Bowers Ave., Santa Clara, Calif. 95051.

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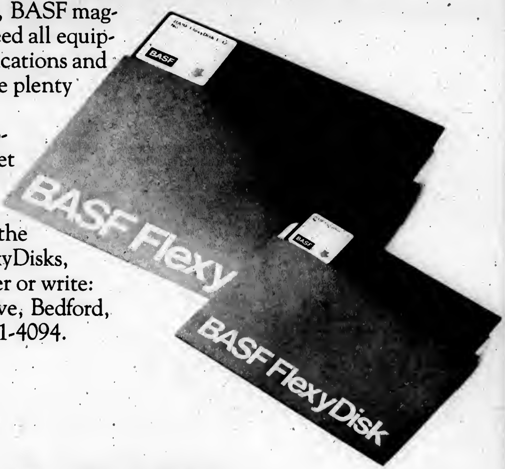

BASF The Original.

Computer Tape Disk Packs Diskettes Cassettes Mag Cards

First-Time User's Network Boosts Its Output Tenfold

(Continued from Page 83)

showed the product's punch-coded item number.

Later, when the purchasing department requisitioned the item from a warehouse, clerks pulled the two card parts from their respective tubs and reran them through the punch machine to produce a tape for inventory updates.

Unfortunately for the department, the process of manually retrieving cards and using the punch machine to generate purchasing documents proved time-consuming and often resulted in clerical errors, Iaia said.

Three Years, 10 Vendors

To overcome these drawbacks, Iaia and purchasing department assistant Richard C. Hopfer decided to replace the punch card/punch tape system with a computer, which they hoped would prove a more adequate alternative.

For three years, the two men evaluated systems from 10 manufacturers including IBM, Digital Equipment Corp., NCR Corp., Burroughs Corp., Singer Co.'s Business Systems Division and Olivetti Corp. Many of the systems they investigated, however, proved unsatisfactory for reasons ranging from excess noise to excess price, Iaia recalled.

Moreover, many of the prospective acquisitions experienced "a great deal" of downtime during sorting, Hopfer explained. "We wanted direct and immediate access to all data stored on fixed or removable hard disk," he said. "We didn't want to carry out a lot of sorting."

As a result, Iaia and Hopfer rejected the other configurations they considered and opted for a Wang Laboratories, Inc. WCS/20 system with a workstation, CRT terminal, 60 line/min printer, 10M-byte hard disk drive unit and a 9-track tape drive unit.

With this configuration, the purchasing department generates big quotation documents by entering the identification numbers for the school district's vendors plus information describing the items to be ordered.

When vendors respond to the department's requests for proposals, Iaia and his staff select the lowest bid meeting their specifications. An operator then enters the appropriate vendor number through the workstation, and the system automatically generates a purchase order.

At the end of the day, the system also produces a purchase registration which lists purchase order number, delivery location, vendor name and number, requisition number and date and the name of the requisitioner.

Inventory Listings

In addition to producing quotation request documents, purchase orders and other paperwork, the system uses the tape drive unit to provide listings of the school district's capital equipment. As the purchasing department receives vendor shipments, computer operators enter the appropriate inventory information, which goes onto disk and then is transferred to tape.

From there, the tape is sent to an IBM 370/138 at the Board of Cooperative Educational Services, which generates and distributes the completed listings to inventory checkers, Iaia explained.

Among the possible enhancements Iaia has considered adding to the system is a communications option that would allow the WCS/20 to transfer capital equipment listing information directly to the 370/138 and thus eliminate the need to first store it on tape. Such an option would reportedly allow the department to edit much of its purchase order information before sending it to the IBM mainframe.

Iaia also plans to create a file that groups vendors according to their areas of specialization and a second file that rates vendor performance, he said.

Pertec Floppy Drive Reads IBM Diskette 2 and 2D

CHATSWORTH, Calif. — A double-headed floppy disk drive unit from Pertec Computer Corp.'s Pertec Division is said to read and write up to 1.6M bytes of unformatted data on both sides of an IBM Diskette 2, 2D or equivalent.

Compatible with the proposed Ansi-standard interface, the FD650 reportedly transfers up to 62.5k byte/sec and accesses in 3 msec track-to-track with 15 msec settling and 35 msec head loading. Users can daisy-chain as many as eight of the units, according to a Pertec spokesman.

The product uses FM and MFM recording technology and provides double-density storage on standard 8-in. flexible media, the company official said.

Head positioning is controlled by a steel band that attaches to the head carriage and to a drive pulley on the shaft of a four-phase 1.8° permanent-magnetic stepper motor, the Pertec spokesman explained. Each step of the motor causes the head to move one track, according to the spokesman.

The FD650, with an electrical door lock and a die-cast aluminum base, costs $755. OEM discounts are available, Pertec said from 9600 Irondale Ave., Chatsworth, Calif. 91311.

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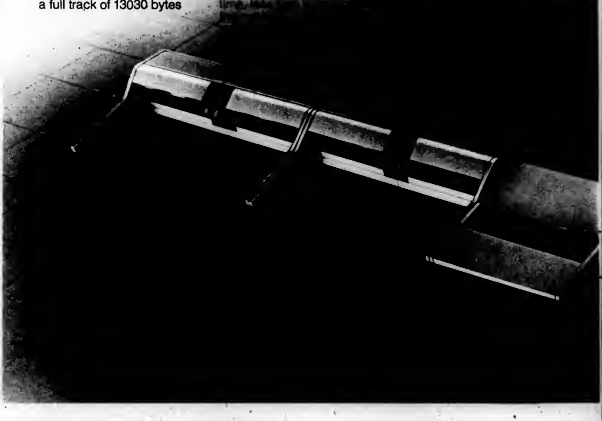


Drives Built for Military

PLAINVIEW, N.Y. — Qantex has introduced two military tape drive systems, one a 5.7M-byte unit that reportedly offers compatibility with all U.S. Navy computers and the other a 5M-byte unit that is said to fit into an aluminum suitcase.

The 5.7M-byte system, dubbed the Model 2420, operates with the AN/UYK-20, AN/AYK-14 and 642B computers as well as with Navy Tactical Data System (NTDS) interface types A, B and C, Qantex officials said. It also emulates the Navy's standard MIL-Spec cartridge memory system, the AN/-USH-26, the spokesmen added.

A typical 2420 is said to incorporate a tape drive, Ansi-compatible formatter, NTDS interface, power supply and enclosure.

Dubbed the Model 2720, the portable system also comes with an NTDS interface and allows users to load a 64K-byte program in 11 sec, company officials claimed.

Both tape system models reportedly come with either one or two transports for 3M Co. DC-300A cartridges, each of which holds 2.8M bytes of unformatted storage. They also read/write at 30 in./sec; rewind at 90 in./sec, record 1,600 bit/in. and transfer 48k bit/sec.

The Model 2420 costs $6,900; single- and dual-transport versions of the Model 2720 cost $6,135 and $7,105, respectively. Qantex is located at 200 Terminal Drive, Plainview, N.Y. 11803.

High-, Low-End Systems Join HIS Level 6 Family

(Continued from Page 83)

One of these computers executes the Level 6 set of 154 standard instructions, while the other processor runs 30 Cobol-generated "commercial" instructions, the officials explained. This second computer, dubbed the Commercial Instruction Processor (CIP), is said to operate twice as fast as its Model 47 counterpart.

The other CPU comes with an 8K-byte cache memory that reportedly cycles in 145 nsec and allows the Model 57 to provide 50% greater throughput than the Model 47.

In a typical application, the high-end Level 6 mini will serve as a host or remote computer in distributed processing networks, HIS spokesmen said.

The Model 23 uses a 16-bit synchronous bus with up to 12 card slots, two of which are occupied by the system's single-board processor, the officials noted. In a prepackaged, "minimount" version of the system, a memory board half as wide as the CPU card occupies a third bus slot. Users can therefore reserve the remaining nine I/O slots for peripheral and communications controllers, HIS noted.

Because each bus adapter accepts up to two controllers, the Model 23 is said to accommodate as many as 18 peripherals or an equal number of synchronous and asynchronous communications lines operating at 75- to 9,600 bit/sec. Peripherals that can be plugged into the bus structure include single- and dual-diskette drive units with up to 512K bytes of storage, 30- to 160 char./sec serial printers, 240-to 900 line/min line printers and CRT terminals like the VIP 7801, company officials said.

The Model 23's lone memory board, meanwhile, holds a minimum of 32K bytes expandable to 128K bytes, the spokesmen added.

Up to 23 Slots

Unlike the low-end system, the Model 57 incorporates a 16-bit, asynchronous Megabus with 10 circuit board slots expandable to 23. In a minimum configuration, one card slot is occupied by the main CPU board, another by the cache memory and a third by a memory management unit, which permits multiple users to share and access programs and data.

Still another chassis slot holds a memory board with up to 64K bytes of standard MOS storage, they noted. The remaining six slots in a basic Model 57 accommodate peripheral and communications controllers, each of which reportedly manage up to four units.

With these controllers, users can reportedly attach CRT terminals, 30 char./sec to 900 line/min printers, 10M-byte disk units and 33M- to 256M-byte mass storage systems plus 800-and 1,600 bit/in. tape drive units.

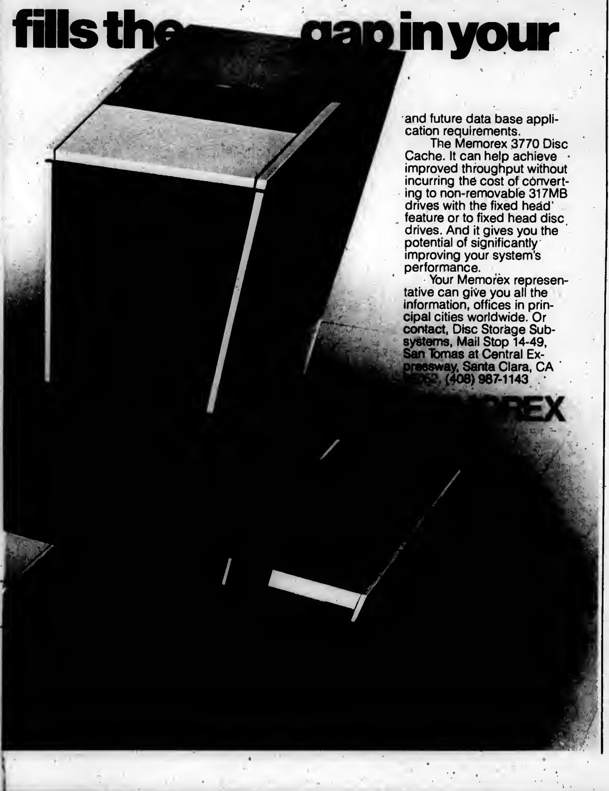
The controllers also allow users to add as many as 128 synchronous and asynchronous communications lines operating at 75- to 9,600 bit/sec, the spokesmen said.

Like the other members of the Level 6 line, the Model 57 requires a minimum of 32K bytes to operate. But with an optional high-density MOS memory that provides 256K byte/controller, users can expand the system to 2M bytes, the officials added.

A basic Model 23 configuration with a 64K-byte CPU, diskette unit, workstation and software costs $13,500.

A basic Model 57 configuration with a 256K-byte CPU, 67M bytes of disk storage, tape drive, console, CRT terminal and Gcos 6 MOD 600 executive costs $127,000. With a 192K-byte main memory, 512K bytes of disk storage, tape drive, printer, card reader, console, 16 asynchronous communications lines and one synchronous line, it sells for $217,000.

The Models 23 and 57 are available from HIS' Small/Medium Information Systems Division at 200 Concord Road, Billerica, Mass. 01821.



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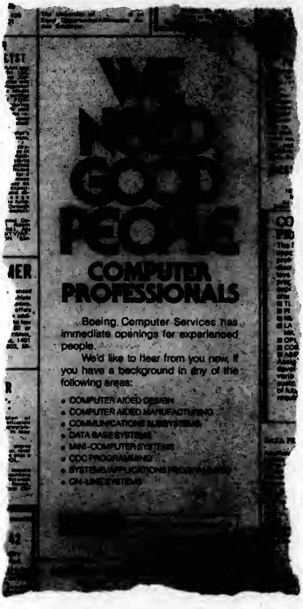

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Micro Boosts Carnival Supplier's Odds

By Tim Scannell
CW Staff

COLLEGE PARK, Md. — Distributing roulette wheels, blackjack tables and bingo apparatus to various charitable organizations is less of a gamble since a company here decided to use a microcomputer system in its operations.

S. Lachman & Sons supplies carnival equipment, as well as paper hats and horns, to schools, churches, fire departments and service clubs that stage fund-raising events. The company, a fourth-generation family-owned business, originally operated under a manual system of stock and customer control. However, as the customer list grew to its present size of more than 40,000 names, this method of conducting business proved to be "terribly inefficient," according to Gary Cooper, vice-president of the firm.

"We were buying mailing lists from outside suppliers and doing everything manually," Cooper explained. "This was very unsatisfactory. The lists we bought were never updated properly and contained many obsolete names and addresses."

After looking at "probably every system in the minicomputer and microcomputer class," Cooper purchased a Pertec Computer Corp. Mits/Altair 8800b microcomputer system.

System Applications

The system is used at Lachman for three corporate functions: mailing list maintenance, accounts-payable bookkeeping and inventory control.

In its mailing list application, the system updates and corrects names and addresses, sorts the names into any desired sequence or category and prints out pressure-sensitive mailing labels. "All we have to do is input the names once at the computer terminal and from that point on, it's very simple to write a little program to sort them into any kind of classification we want — alphabetical by Zip Code, by type of business or whatever," Cooper said.

"If I want to sort through my 40,000 plus names and mail only to fire departments in Delaware, the computer can do that. And if I want to compound that with fire departments in Virginia and West Virginia, all I have to do is put in each of those three diskettes for a couple of minutes. The next thing I know, the machine has sorted together a brand new list of fire departments in those three states," Cooper explained.

(Continued on Page 92)

Text, Graphic Display Board Bows

ANDOVER, Mass. — Miniterm Associates, Inc. has introduced a combination text and graphic video display board for users of S-100 bus microcomputer systems.

The Merlin video interface combines the functions of text and graphics display and a keyboard input port, a spokesman claimed. The unit is said to be capable of displaying 20 lines of text, both upper and lower case characters, with a capacity of 40 char./line.

The 4K control read-only memory (ROM) of the system provides a keyboard driver with "Edit-key" decoding, display output with auto-and "wrap-around" scrolling, 14 monitor functions, 24 cursor/edit functions, graphic subroutines and a keyboard graphic drawing mode, according to the spokesman for the firm. The unit can be tailored to individual user systems with four definable monitor keys, seven edit keys and selectable I/O drivers, the company spokesman added.

The unit employs a direct memory access (DMA) controller, and the display address as well as the display mode are software programmable, the spokesman stated.

The control feature allows the user to define two separate display areas and modes, switching from one to the other via the keyboard. A default text mode reportedly makes it possible to display lines without the need for space-fill characters at the end of each line, the spokesman for the company claimed.

Merlin costs approximately $500 assembled and tested or $300 in kit form without ROM software from the company at Dundee Park, Andover, Mass. 01810.

Video Interface Includes 1K RAM

CANOGA PARK, Calif. — A 16-line by 64-char. video interface from Nucleonic Products Co. is said to accept data at TTL levels in Ansi standard Ascii and provide a composite video output which can be connected to any standard CRT unit.

The CRT-1000 includes 1K of random-access memory (RAM), a row-scanning character generator and a video processor, the firm said. Video and synch timings are switch-selectable and the timing is crystal-controlled. However, the dot frequency can reportedly be adjusted to accommodate different CRT screen widths and scan rates.

Cursor Commands

The units responds to such cursor commands as "erase page," "cursor home," "erase to end of line," "cursor return," "cursor left," and "cursor down." In addition, an "erase line" function is provided which does not affect the cursor position, a spokesman claimed.

In addition, automatic scrolling and a "roll screen" command are available. The latter causes the bottom line to be replaced by what was previously at the top of the screen, the spokesman added.

The CRT-1000 is available in both a 50Hz and a 60Hz version for $119.95 from the firm at 6660 Variel Ave., Canoga Park, Calif. 91303.

Microage Packages Software For Business, Math, Games

TEMPE, Ariz. — Microage has inroduced several application software packages on mini-diskette in North Star Computers, Inc. format for users of S-100 bus, 8080/Z80-based microcomputer systems.

The packages include financial, mathematical analysis and statistical programs from *Some Common Basic Programs* by Osborne & Associates; a backorder program using disk data files and a mailing list program, a spokesman for the company said.

Two disks of games, volumes one and two, are also offered by the company. They include such programs as trap, Taxman, Mathdrill II, Calendar, Civilwar, Golf, Lunar Lander Mathdrill, Hukle, Taxman, Weekday, Button, Frog, String, Change, and Shooting Star, for example.

In addition, Microage is offering Northstar DOS for Centronics printers which permits retail sales reporting using disk files.

The programs cost $35 each from Microage Mail Order at 803 N. Scottsdale Road, Tempe, Ariz. 85281, or write the company at 1425 W. 12th Place, #101, Tempe, Ariz. 85281.

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Micro Boosts Business Odds For Carnival Supply Firm

(Continued from Page 91)

Aside from the initial cost of the microcomputer and its peripherals, storing the mailing list data on diskettes is as economical as the old system of keeping the names on labels, Cooper continued. "I get about 2,000 names on each diskette, which means it's costing about 5 cents per name for storage. And here we can use each name an unlimited number of times and re-sort the names in unlimited different ways."

Accounts Payable

Lachman's Mits/Altair system also handles the company's accounts payable, replacing a large mechanical bookkeeping machine previously used for this purpose, Cooper said. "Our computer makes posting (transferring entries) a lot faster and it doesn't have the maintenance problems of the mechanical system. We just key in an account number and the system automatically searches the files, gets the account, finds its past balance, asks you the pertinent questions and does all the posting," Cooper said. "When it's finished, it gives you a hard copy."

The computer has also done away with the need for manually handling ledger cards, Cooper continued. "Any comparisons that our accountant needs to make are done by the computer rather than by hand or by adding machine. By reducing the number of hand entries, it reduces the number of mistakes and gives a much neater, cleaner finished product," he noted.

Inventory Control

A third major task performed by Lachman's microcomputer is inventory control. "While we don't keep a computerized perpetual inventory on all of our 10,000 different items — many of which cost less than a penny each — we do use the computer to keep track of certain staple, frequently used items," Cooper explained. "The computer keeps the records of what we purchase and sell so that we can make monthly comparisons and order more efficiently in the future."

Along with these major applications, the microcomputer also prints shipping lables and charts when needed, automatically types letters via a word processing program and calculates odds for customers using bingo and other games of chance for fund-raising purposes.

The 8800b at Lachman's includes two floppy disk drives, a CRT terminal and a printer. One of the main reasons the firm chose to purchase the Mits/-Altair system was because it was "complete," Cooper recalled. "The other vendors had portions of systems but Mits had everything, put together and working."

Future Plans

Future plans for the system include adding payroll and acounts receivable for the 15-employee firm. "In the accounts receivable system, we plan to keep all the current accounts on-line so that the system will be used for realtime inquiry to the data base as well as posting invoices," Cooper said.

"I also plan to put several on-line terminals in our front office so that our billing clerks and other personnel will be able to call up any account by number, see the balance, check whether it is past due, see how much the customer has purchased in the past and so on," Cooper added.

Cooper said he is also considering integrating a time-sharing version of the Basic programming language that will allow several terminals to access the system concurrently without interfering with each other.

"The small businessman no longer has to decide, 'Do I do it by hand or spend $50,000 for a computer?,' " Cooper noted. "For the cost of a bookkeeper for one year, he can pay for the whole system. It pays for itself in one to two years in labor savings alone."

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Upkeep Firm to Service Rocky Mountain Region

BOULDER, Colo. — Microprocessor Computer Systems Corp., a minority enterprise, has announced a microcomputer systems maintenance service for the Rocky Mountain region of the country.

The service is available for terminals and systems from Texas Instruments, Inc., Lear Siegler, Inc., Soroc Technology, Inc., Diablo Corp., Digital Equipment Corp., North Star Computers, Inc., Tec, Inc., Applied Digital Data Systems, Inc. and Malibu.

The firm will offer both field and walk-in service as well as annual maintenance contracts, a spokesman said. It will reportedly be maintaining a "full line of parts" manufactured by the companies whose equipment the firm services.

The firm, at 1280 28th St., Boulder, Colo. 80303, is a distributor for computer systems and terminal equipment, including microcomputers, CRTs and printers for business, research and industrial applications.. The firm's services include both hardware and software maintenance, the spokesman said.

Varta Battery Backs Up RAMs

ELMSFORD, N.Y. — A 9V rechargeable nickelcadmium battery has been unveiled by Varta Batteries, Inc., for use as a backup power supply for semiconductor random-access memories (RAM).

The battery has a capacity of 110 mAh and a discharge voltage of 8.4V, the firm said. The approximate lifetime per charge of the battery is 10 hours and the unit can be recharged up to 1,000 times, the firm claimed.

The battery can reportedly be fully recharged in 14 hours or permanently trickle-charged for buffer and standby operations.

The approximate price of the battery is $9 with an optional charger unit priced at an additional $6 from the firm at 85 Executive Blvd., Elmsford, N.Y. 10523.

Firms Offering Free Brochures

- Tektronix, Inc. is offering a four-page application note detailing how to use a logic analyzer to debug a microprocessor-based process control system. The pamphlet also highlights two common problems associated with debugging such systems. Tektronix can be reached through P.O. Box 500, Beaverton, Ore. 97077.
- A series of synchro-to-binary coded decimal converters that are available with either three- or four-digit unipolar or bipolar outputs is described in a two-page data sheet available from Natel Engineering Co., Inc., 8954 Mason Ave., Canoga Park, Calif. 91306.
- A catalog covering the major microcomputer development systems and logic analyzers is being offered by Microcomputer Rentals. The catalog, containing information on all the systems rented by the firm, can be obtained by sending a letterhead request to the company at 705A Lakefield, Westlake Village, Calif. 93161.
- A 48-page catalog published by Datel Systems, Inc. describes the company's line of monolithic and hybrid data converters. The firm is located at 1020 Turnpike St., Canton, Mass. 02021.
- A 32-page "short form" guide to Analog Devices' line of measurement and control products is available from the firm. The catalog includes details on digital-to-analog and analog-to-digital converters, multiplexers, switches, amplifiers, transducers and I/O subsystems. The company is located at Route 1 Industrial Park, P.O. Box 280, Norwood, Mass. 02062.

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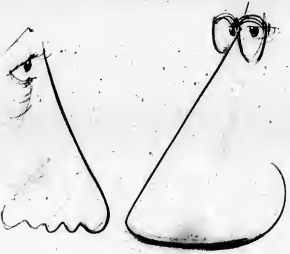

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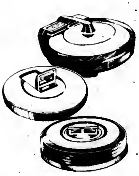

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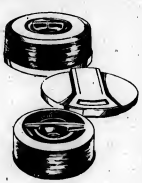

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From IBM as Early as 1980

Industry Seers Expect H Series After E

By E. Drake Lundell Jr.
CW Staff

While industry prognosticators are confident about their forecasts of the E series from IBM [CW, June 6], they are less willing to make predictions about the next series of machines expected from the firm.

All agreed, however, that the next major announcements after the E series will be about what is known internally at IBM as the H series of machines and that these will eventually cover the 370 line from the Model 148 class of machines upward.

But they are less sure about the exact timing of the announcements or the specific characteristics of the machines themselves. The best guesses at present are that the first members of the H series could appear as early as the beginning of 1980.

While IBM is expected to follow a "bottom-up" announcement strategy with the E series (announcing the smallest members of the family first and the larger systems later), an opposite — or "top-down" — strategy is expected with the H machines.

Under this scenario, IBM will announce the largest H machine first. This machine is expected to be larger than the present 3033 and therefore not impact the 30 series machines IBM is now producing. Only later would IBM announce smaller models of the H series.

Several observers expect IBM will leapfrog present technology and use 64K chips in the H series of machines, bypassing 32K chips.

One observer believes the H machines will essentially serve as mid-life kickers for the present 3031, 3032 and 3033 processors and therefore not be radically different in architecture from those machines, which themselves are just improved 370 systems.

At the same time, however, he predicted a system called Sierra is being developed by IBM for announcement in the mid-1980s to replace the entire 30, E and H series. The Sierra system would incorporate ease-of-use features that would make it simple to operate by the ultimate users of the system, he indicated, and would incorporate an entirely new operating system as well as some major hardware advances.

ADL's Gimbel Sees Vendors Geared to Accommodate DDP

By Marcia Blumenthal
CW Staff

CAMBRIDGE, Mass. — Distributed data processing (DDP) is an evolutionary rather than a revolutionary concept, and the hardware for DDP is hardly unique, according to Norman S. Gimbel of Arthur D. Little, Inc. (ADL) here.

Since 1976, many large integrated DP manufacturers have been building enhancements into their systems that incorporate features to facilitate distributed systems, the head of the Distributed Systems Unit of ADL's Information Systems Section said.

Gimbel, who directed a recently completed ADL Impact Services study on DDP, pointed out the manufacturers committed to DDP architecture are emphasizing DDP features such as resource-sharing capability and the ability to support smaller networks in developing their latest data communications products.

Gimbel forecast that the market for DDP products will reach $5 billion by 1983, with integrated DP, minicomputer and terminal manufacturers shipping $4.2 billion. In 1977, he noted, these three categories of manufacturers together shipped only $300 million worth of DDP products.

However, Gimbel cautioned that system enhancements have only been developing since 1976 and, because there has been little field experience in using these products, his predictions have a high degree of uncertainty. He anticipates it will be three years before anyone can predict the future of DDP with a high degree of confidence.

Three Leaders

Gimbel identified IBM, Digital Equipment Corp. and Hewlett-Packard Co. as the integrated manufacturers leading the pack in developing network architecture.

"The network architecture that each of these companies commits itself to is of fundamental importance," Gimbel stressed, "because they will use this architecture as a framework to fill out their product lines for distributed systems usage."

IBM in particular, with its Systems Architecture Network product line, has emphasized DDP and has the resources and the customer base needed to compete in this market, the ADL expert said. "This is a very complex product," he added, "and the development costs for the product are one of the chief market considerations. IBM has a tre-

(Continued on Page 97)

IBM-AT&T Satellite Clash Seen Benefiting Smaller Users

By Brad Schultz
CW Staff

WOBURN, Mass. — A major clash between IBM and AT&T over various data communications markets in the 1980s will benefit small to medium-size consumers of those markets, the president of The Yankee Group predicted here recently.

Rising labor costs combined with plummeting hardware costs will prompt managements to "get that intelligence in the field," Howard Anderson said. It will then make sense for many organizations to establish distributed data processing (DDP) networks, bringing sophisticated communications technology to rather "obscure" outpost facilities where labor is comparatively cheaper, he explained.

The introduction of services from Satellite Business Systems (SBS), in which IBM is a partner, will accelerate this trend among large firms and agencies, Anderson said, noting that only large organizations will be able to afford the $320,000 to $340,000 antenna installations necessary to receive SBS broadcasts.

Yet sales of SBS services will actually expedite sales of the competing Bell Data Network (BDN), he said, because even large organizations will not be able to afford SBS antenna installations at outlying sites; instead, they will be inclined to implement BDN or equivalent communications be-

(Continued on Page 96)

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IBM-AT&T Satellite Battle to Benefit Users

(Continued from Page 95)

tween outposts and central or primary SBS facilities.

The resultant high demand for BDN, IBM's counterpart System Network Architecture (SNA) and equivalent products will drive down the cost of those products, benefiting the small to medium-sized independent or outpost user, Anderson continued.

Important IBM Market

IBM cannot rely too heavily on its office equipment business if the firm is to maintain a dynamic growth rate, Anderson said, pointing out that there are limits to which offices can be automated.

Citing a recent International Data Corp. study on "the office of the future," Anderson said 51% of a typical corporate secretary's work time is devoted to activities "away from the desk" that cannot be simulated by a machine.

IBM must therefore enter the telecommunications industry despite certain opposition on that score from the U.S. Justice Department's Antitrust Division, Anderson believes. In the 1980s, the computer industry will actually become a "subset" of the telecommunications industry, he added.

The cost of computer hardware is sinking fast while the cost of communications is rising fast, Anderson noted, indicating that DDP is basically a reaction against the latter trend.

IBM has "slipped badly" twice in the last 15 years by allowing the emergence of minicomputer and plug-compatible CPU vendors as alternatives to mainframe-bound IBM, Anderson said. Having lost those markets, IBM is not about to pass up the new DDP market, he indicated.

Anderson stated two "precepts" of IBM marketing strategy: "Never let anything get in the way of access to IBM customers" and "Never let anything get in the way of access to IBM markets."

Unless it moves solidly into DDP, IBM could lose a critical portion of its potential business in the 1980s, he said. He added, however, that, on the other hand, AT&T knows it could lose the substance of its business to IBM.

AT&T Move

Independent telephone companies generally operate at a loss within their respective regions, Anderson said. These companies make up this loss with their share of AT&T's long distance call earnings, deriving 50% of their revenues from "AT&T Long Lines," he noted.

SBS electronic mail services threaten to cut sharply into those long distance revenues, Anderson said. Accordingly, AT&T must move into the area of computing or perhaps offer electronic mail itself, he indicated.

However, AT&T is also faced with Antitrust Division opposition, bound by a 1956 consent decree which prohibits its moving into computing.

Anderson thus presented a vision of the world's largest mainframer and the world's largest communications vendor engaged in a marketing "war" while the Justice Department feebly attempts to diffuse both parties in what would be a long process of litigation. The battle will be joined as both firms vie for consumers of controllers, multiplexers, front ends and smart terminal networks, Anderson said, adding that worldwide sales revenues on these product types are currently growing at an annual rate of 300% to 400%.

New Companies

Samson Software Service has been formed to provide programming, consulting and analytical support. Service is available on a national network basis, according to the firm located at Suite 114, 14737 Sherman Way, Van Nuys, Calif. 91405.

Arinco Corp. has been formed as a DP consulting firm primarily engaged in international market and product development projects for computer equipment manufacturers. The firm is located at Suite 112, 105 E. Marcy, Santa Fe, N.M. 87501.

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Goes Legislative Route

Wisconsin Kills 4% Sales Tax on DP Services

By Marguerite Zientara
CW Staff

MADISON, Wis. — Wisconsin no longer levies its 4% sales tax on "the sale of computer and data processing services including time-sharing, designing or converting systems, programming, consulting, training, reformatting of data and computer printing."

Gov. Martin J. Schreiber signed Assembly Bill 1220 on May 12, repealing a bill passed in the spring of 1977 taxing those items. The bill taxing processing and programming work was implemented last August, according to Glenn Jacobson, executive vice-president of the Southern Wisconsin Chapter of the Data Processing Managers Association (DPMA), which worked on the issue.

In response to the bill taxing software in Wisconsin, the Committee United for Tax Equity (Cute) was formed late last fall.

Cute is comprised of businesspeople who independently had been trying to fight implementation of the sales tax.

By organizing as Cute, these businesspeople were finally able to introduce a single bill to repeal the sales tax, Jacobson said.

Wisconsin has a two-year budger cycle but, during the in-between year, "mini-budget" bills can be introduced that make amendments, so that some budget work is done every year, Jacobson explained. Cute got enough support in the Joint Finance Committee, which in turn applied pressure on the governor's office, that Assembly Bill 1220 was introduced as an amendment in the mini-budget cycle, he said.

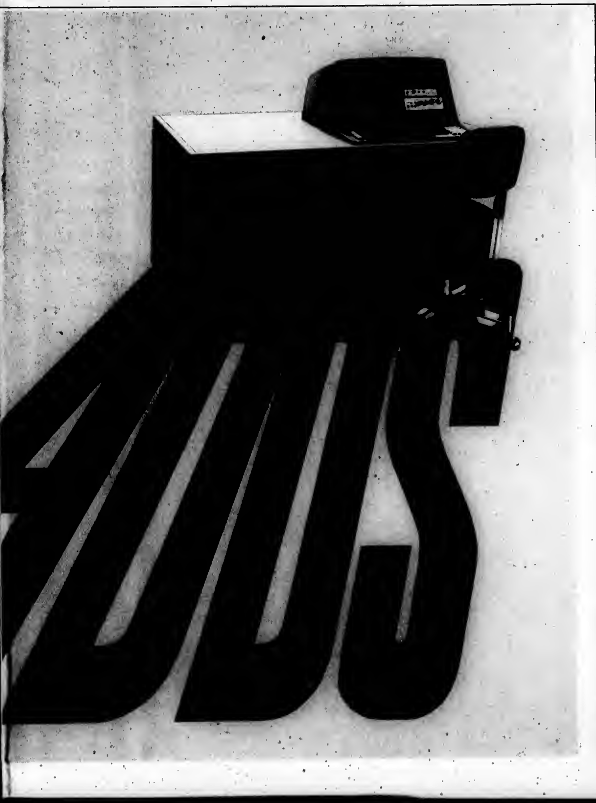
Two major factors helped get the bill introduced, Jacobson said. The tax originally went through because the state needed additional revenue; in 1978 the state had a surplus of almost $450 million.

"It was very obvious that after the first year there was no additional revenue needed," he said.

The second factor was that the brunt of the tax had essentially been borne by small businesses using service bureaus. For that reason, legislators received a lot of pressure from the Wisconsin Merchants Association, which was opposed to the tax. The state was "even taxing any company which operated as a data processing service organization. That meant that in some cases where large corporations had a separate corporation to do their own internal data processing work and were billing out to another corporation, they had to charge their own company the 4% sales tax," Jacobson noted.

According to Jacobson, after the bill was introduced, "it went through without any problems whatsoever.

"I think that we were very fortunate in Wisconsin. We are the first state that I know of to successfully kill the DP tax through the legislative route, rather than going through the judicial system," he added.



Gimbel: Vendors Geared for DDP

(Continued from Page 95)

mendous edge here."

Of the other major DDP market leaders, DEC has its Decnet product line and HP has its Distributed System Network. Both of these companies are currently updating their initial product lines based upon real field experience, Gimbel said, adding both companies are also stressing the marketing of these lines.

A group of other suppliers such as Data General Corp. is holding back, waiting until the smoke clears, Gimbel observed. He made no criticism of this group, indicating this is perfectly rational strategy.

Terminal manufacturers are another group making a significant impact in the DDP market. Today, Gimbel said, the three terminal manufacturers most involved with DDP are Datapoint Corp. with its ARC system, Sycor, Inc. with its 445 Sycorlink and Four-Phase Systems, Inc. with its unique software approach.

Aside from manufacturers, value-added network vendors and remote computing services (RCS) were examined in the study to determine what kinds of products and services they might offer to give customers more distributed capability. The study concluded that RCS firms will probably not offer a product for implementing private networks.

Users are a primary force in propelling the development of DDP systems, Gimbel noted. "The user community is looking for cost-effective DDP networks, and it looks like the products which have been coming along in the past two years are starting to deliver what the user wants," he said.

On the other hand, Gimbel said, there are many users who have systems they have built over the years. These users have put a great deal of money and effort into building their systems, and they are not about to obsolete them overnight.

Rather, the process of moving to DDP systems will be evolutionary as these users gradually update their networks, Gimbel said.

In Products, Markets, Size

Dramatic Changes Cited in Personal DP Area

SAN JOSE, Calif. — The development of the personal computer industry between 1974 and 1977 can be summed up in a word — new; new companies selling new products at new prices to new customers through new channels of distribution.

In the last 12 months, there have been dramatic changes in the personal computer industry, according to a report recently released here by Creative Strategies, Inc. (CSI). Large firms such as Pertec Computer Corp. and Tandy Corp. (Radio Shack) entered the market.

Production capacity rose from 50,000 units to 8,000, including for the first time, stereo and department stores. Radio Shack, with 7,000 stores now carrying computers, accounted for the major retailer growth, the report noted.

Unit shipments for 1978, the report predicted, will rise to 278,000 from 43,000 systems shipped in 1977. By 1982, the personal computer segment of the industry will have grown to $3.5 billion, having started from virtually zero in 1974. Software packages and peripherals will constitute a large percentage of the overall revenues.

Nine Market Segments

The study identified nine major market segments: six for nonhome use and three for home use. Nonhome users include very small businesses, low-end business applications, self-employed professionals, scientists, educational institutions and industrial applications.

Because of the acute need for DP power in small organizations, the market for personal computers in the small business sector is expected to top $1 billion by 1982, the report concluded.

On the other hand, the home usage sector is made up of hobbyists, home programmers and consumers. CSI defined the hobbyist as a person who likes to assemble the hardware but who has little interest in learning to program. The report suggested that this market has already peaked.

Of more interest were the home programmers — people willing to invest time in original programming and debugging — and consumers, those users who are interested in specific purchasable application packages. Researchers noted, however, that the distinction between these two segments is diminishing.

The ultimate number of prospects for home applications was a major question addressed by researchers. After interviews with more than 100 industry participants and five consumer surveys with members of various social groups, CSI concluded that the true home market for personal computers is 20 million households out of a total of 77 million.

Overall, the personal computer will not change society, the report suggested, but will be integrated into the life style of a specialized group of consumers. Demographic characteristics of this group included households that consist of professionals, technicians and managers who have some college education and an adjusted gross income of more than $15,000.

Competition for both sectors of the market will come from a variety of directions. Researchers stated that entrants will primarily be consumer electronic firms and manufacturers of intelligent terminals, minicomputers and office equipment.

Texas Instruments, Inc. will become the dominant force in the industry by 1979, the report contended. Semiconductor dominance, consumer retailing experience and a strong brand image were identified as some of the factors contributing to TI's future market strength.

IBM will not be left out in the cold, the study maintained. The giant will by-pass the home market sector, capitalizing on its direct sales force and worldwide reputation for service to capture a large share of the nonhome market.

The study, "Personal Computing," is priced at $695 and is available from CSI at Suite 275, 4340 Stevens Creek Blvd., San Jose, Calif. 95129.

DSI to Market Series/1 Basic

DENVER — DSI, Inc. has acquired exclusive marketing and licensing rights to the Basic/1 language system for IBM Series/1 minicomputers, according to Larry Johnston, DSI president.

"The Basic/1 interpreter fills a real need for IBM's Series/1 software accessories," Johnston said, "and our marketing efforts were designed to dovetail with IBM's Series/1 marketing."

The firm, which originally became involved with the Basic/1 system as a supplier of Series/1 turnkey systems, acquired North American licensing rights from the original developer of the Basic/1 system, Graham Computer Enterprises. DSI will honor all Graham Computer Enterprises licensing commitments.

Foreign licensing rights have been awarded to Gulf Computing, Kuwait, DSI reported.

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Average Upkeep Costs Pegged at 7.6% of Budget

PENNSAUKEN, N.J. — DP users in the business sector spend an average of 7.6% of their annual DP budgets on maintenance, according to a survey recently released by Alltech Publishing Co.

However, the study noted that there is a great difference in the cost of maintaining computer installations, with maintenance budgets ranging from .2% to 31.5% of the annual DP budget.

The four-volume study, "Maintenance Considerations in the Information Handling Marketplace," also detailed maintenance requirements for the personal computing and federal government sectors.

The business segment of the study was drawn from interviews with 54 user organizations, 23 equipment suppliers and 16 third-party maintenance firms.

Of the 54 user installations surveyed, 92.9% used maintenance services supplied by CPU manufacturers, the report stated.

Interestingly, the report concluded that maintenance personnel have a significant influence in the sale of computer equipment. The data indicated that 20% of the users surveyed purchased equipment based on advice given by maintenance personnel.

Manager's Burden Increased

However, as DP managers are increasingly finding their systems configured with components from multiple suppliers, they are required to take a greater role in managing their installations rather than relying on equipment suppliers to perform that function by default. The mixed-vendor environment is a key problem area currently facing many users, the report said.

The majority of user respondents rated their overall maintenance services satisfactory. However, six users (10% of the sample) rated maintenance unsatisfactory, which, according to Alltech, presents an important opportunity for third-party vendors.

Respondents cited two significant advantages in using third-party maintenance firms. First; the user can install peripheral equipment other than that manufactured by the CPU supplier. Second, a competitive situation develops, causing the user organization to receive better vendor performance.

The study examined maintenance considerations from the perspective of the user, equipment suppliers and maintenance vendors. The four volumes include an executive summary of the entire study (Volume 1), a marketplace overview and an analysis of the personal computing sector (Volume 2); a discussion of maintenance considerations for the business DP sector (Volume 3); and a description of the maintenance of DP equipment installed in the federal government (Volume 4).

The study costs $6,000 and is available from Alltech Publishing Co., 212 Cooper Center, North Park Dr. and Browning Road, Pennsauken, N.J. 08109.

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*NOVA is a trademark of Data General Corporation.

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Acquisitions

Sun Information Services Co. has acquired all of the stock of **The Weiland Computer Group, Inc.**, a privately held company based in Oak Brook, Ill. The Weiland group will operate as an independent subsidiary.

On-Line Systems, Inc. has purchased **Bili Associates, Inc.**, a software and consulting firm based in Boston. On-Line Systems has created a project management division to be staffed by the members of Bili and some additional On—Line Systems personnel.

U.S. Datacorp has announced that a tentative agreement has been reached to acquire **Micromation Corp.**, a computer output microfilm service company headquartered in Miami, Fla. Terms of the sale were not disclosed.

Control Data Corp. has acquired the assets of **Computing Associates, Inc.** of Tucson, Ariz. The firm will become part of CDC's Professional services Division. Terms were not disclosed.

McGrawHill, Inc. has acquired the assets of **Edutronics Systems International, Inc.**, a subsidiary of Coleman American Companies, Inc. The purchase was for an undisclosed amount. It will operate as a division of the McGraw Hill Book Co. Under a licensing agreement, Coleman American will continue to market Edutronics products and services in a number of foreign markets for several years.

Tymshare, Inc. has acquired the business and assets of Autotax, a privately owned publisher of business and tax publications.

Network Analysis Corp. has acquired **SRA Communications.** SRA was formally owned by a subsidiary of Automatic Data Processing, Inc.

Itel Corp. has agreed to acquire **Health Control Corp.** of Dallas, Texas, for an undisclosed number of shares of Itel Stock.

Tymshare Inc. and **Medical Information, Inc. (MII)** have reached an understanding for the acquisition of MII by Tymshare. Completion of the acquisition is subject to final contract approval.

Xitan, Inc. has purchased the assets of **Technical Design Labs, Inc.**, a firm that caters to the personal and hobbyist computer markets.

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Executive Corner

- Donald W. Fedderson has been appointed president and chief executive officer at Application, Inc.
- Albert P. Francis has been named vice-president, Plato business office, for Control Data Education Co.
- Rigdon Currie has been appointed to the new position of vice-president of business planning at Diablo Systems, Inc.
- Dr. Warren C. Tyler has been named executive vice-president for Data Terminal Systems.
- John W. Burger has been appointed director of communications systems for General Dynamics communications Co.
- David Nielson has been appointed vice-president and regional manager at Greyhound Leasing and Financial Corp., Phoenix. Joseph J. McCusker has been appointed assistant vice-president of the Dallas office; William H. Valler, New York office; Kenneth B. Giddes, Atlanta office and James P. Dugan, New York office.
- Allen R. Heimer has been promoted to president of Cobaloy Co., a division of Graham Magnetics, Inc., and to vice-president and quality assurance manager of Graham.
- James A. Oles has been named sales manager of CMI Corp.
- Stanley J. Knight has been appointed assistant to the president at Inforex, Inc.
- Cognitronics Corp. has announced that David Shepard has been elected to the new post of chairman and William J. Lawless Jr. has been elected president. Ralph Palmero, together with Shepard and Lawless, will constitute the "corporate office."
- J.H. Smith has been elected chairman of the board of Warrex Computer Corp.
- Robert G. Fritsky has been appointed vice-president of marketing at Continental Computer Leasing Corp.
- Martin J. Weisberg has been named director of marketing at Millennium Systems, Inc.
- Wesley V. Winsor has been appointed a vice-president of Information Sciences, Inc.
- Salvatore Brucculeri has been named controller of Mathematical Applications Group Inc.
- Peter F.W. Raiswell has been named vice-president of administration at Threshold Technology, Inc.
- William W. Chorske has been elected a senior vice-president of the Perkin-Elmer Corp. Chorske recently was appointed general manager of the company's Data Systems Group.
- Dr. James Cunningham has been named head of National Semiconductor Corp.'s magnetic bubble memory operation.
- Bob L. Buatt has been promoted to vice-president of customer services for Informatics Inc.'s Equimatics Division.
- Krishna V. Srinivasa has been elected president and chief executive officer of Programmed Closing Systems, Inc.

Foreign Orders & Installations

Shell International Petroleum Co. has installed two Univac 90/30 systems in its DP facility in the Shell Centre, London.

The Aerospace Division of Saab-Scania AB has ordered a SEL 32/75 system from Systems Associates AB, the Swedish agent for Systems Engineering Laboratories, Inc. The system is valued at $250,000.

A Univac 90/30 system has been installed by Erik Myhre's Travel Agency, the joint owners with Braathens, a Norwegian airline.

Barclay's Bank has ordered 100 self-service financial teller terminals valued at $3 million from NCR Corp.

Spain's largest bank, Banco Espanol de Creditor, headquartered in Madrid, has ordered a large-scale system from Univac valued at $4.6 million.

You'd probably like to switch over from your IBM 3270's to more versatile equipment, but you're not ready to bite the bullet. Well, there's a complete terminal system that will make the change painless because it's 100% IBM plug compatible. A terminal system with features you won't get from IBM for years, if ever. A terminal system that can easily provide special functions. A terminal system that's software modifiable to future changes in network line protocol requirements.

The terminal system is the Trivex Plus 70. And in addition to having all the functional capability announced by IBM, Trivex 3270 compatible units offer you those valuable extras that can make your job a whole lot easier.

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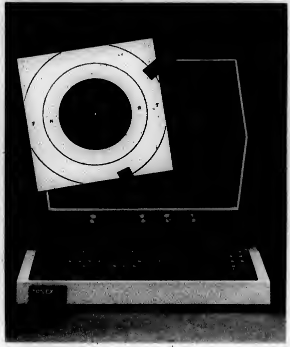

Well, that's precisely where our Trivex Target Test comes in. Check it out. In about 60 seconds you'll know whether or not you should give Trivex a call.

The Target Test

CHECK ONE	YES	NO
1. Does a single device failure take your complete cluster off line?	☐	☐
2. Does a single device failure take your complete channel down?	☐	☐
3. Will remote communication speeds, switch selectable, up to 19.2KBS improve your network efficiency?	☐	☐
4. Do your programmers need more information displayed to efficiently develop and debug software?	☐	☐
5. Are there one or more special functions you need to make your job a lot easier?	☐	☐

Results:
Score 20 points for every "yes" answer. If you scored 20 points or below, you've got nothing to complain about. Don't change a thing.

If you scored 40 points, you may not make the switch yet, but an inquiry is in order.

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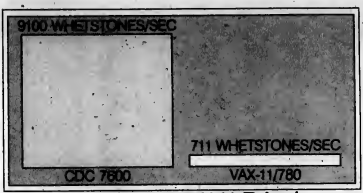
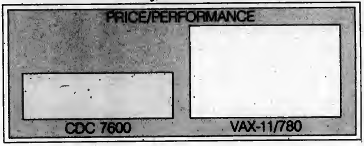
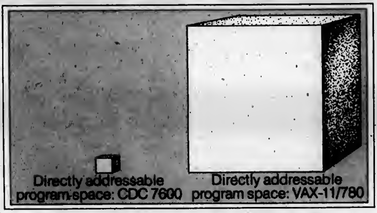


Round two to VAX: Price/Performance. The 32 bit VAX is the world's fastest mini. A $141,000 VAX system runs 711 double precision Whetstones. That's one twelfth the speed—at one twenty-fifth the cost. A dozen VAX systems could equal the throughput of one 7600—and you'd still save literally millions of dollars.





Round three to VAX: Program size. Virtual addressing and a gigantic 32 bit address size, compared to the 18 bit address size of the CDC 7600, allows VAX a directly addressable program size that is—are you ready?—1000 times larger than the CDC 7600.

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● Applicants for the above programming positions must possess a background in one or more of the following areas: microprocessors, operating systems, distributive processing networks, assembly and higher level languages. Requirements also include ability to communicate effectively, desire to work with customers, and a BS in CS, EE or Math.

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Texas Instruments, Industrial Automation Center, in Southfield, north of Detroit, has Immediate openings for qualified systems programmers to work on varied computer based automation requirements. These opportunities are also a part of the Digital Systems Division in Austin, Texas. These positions entail generating unique applications programs in response to customer specifications and hardware configuration for manufacturing automation. BS in EE, Physics, Math or Computer Science and related experience in minicomputer applications required.

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Hvy des exp stressed in med'l sys. Respons for setting up software on DEC Sys 10; Sys input & constructing edit prgrms. Advise & assist in gen'l debugging & oper sys concepts. Des credibility can suffice for lack of specific DEC exp.

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Function as consultant non EDP oriented users. Diagnose prblms & dev prgrms to alleviate prblms. Hvy FORTRAN candidates can become more involved in the area of QC analysis. Pluses incl DEC Sys 10 with DPL.

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We have an excellent opportunity for someone to be involved in the planning and execution of a series of computer-related conferences across the United States. These conferences are held in conjunction with trade shows managed by our company, and involve hundreds of speakers and thousands of attendees.

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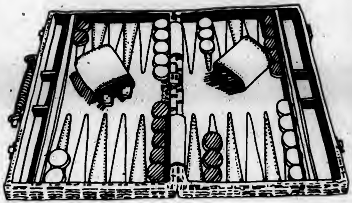

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Opportunity to join small group and work on real-time systems development Should have experience in developing programs in both ASSEMBLY and FORTRAN languages, and have or seek overall systems understanding in a state-of-the art computer manufacturing environment. Experience preferred in Operating Systems, Inter CPU Communications, Data Base Compiler Design, Man-Machine Interface or Display Compiler Design.

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Right now, our thrust is toward the development of network distributive processing, with on-line office automation, electronic mail, and a sophisticated system of satellite business offices. To effectively develop and implement our effort in this direction, we need people. People who are good at what they do. People who are good at the following:

SYSTEMS SOFTWARE

Our hardware consists of IBM 370/158 operating under OS/SVS and a DEC System 10. The IBM 370/148 and several PDP 11's are scheduled for installation as we enter network distributive processing.

At Gillette, the challenges are exceptional. Our equipment is highly sophisticated. Our applications advanced. Planned technological upgrading of both hardware and software will soon create an even more rewarding environment.

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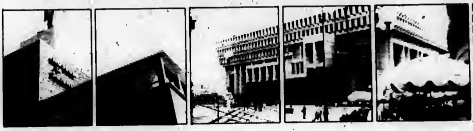

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To qualify you will need excellent interpersonal and communication skills and a solid background in COBOL and JCL/Utilities. Experience in the following areas would be beneficial: TSO, VSAM, IMS, ALC, Mark IV, or Top-down design/structured programming.

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In return for your technical know-how we offer an excellent package of compensation that includes top benefits and exciting potential for growth. For confidential consideration, please send resume and salary history to: Elaine Ridley, 400 N. Capitol St., Washington, D.C. 20001. An Equal Opportunity Employer M/F.

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PROGRAMMERS

These positions will support the development and maintenance of information systems for various user areas. Functions include programming for modification/maintenance of existing system. One position requires three years programming experience on IBM 370 and BAL. Other positions require three years programming experience in COBOL or Fortran and experience on IBM 360/370 or Honeywell 6000. Familiarity with DDS or Dbomp a plus.

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We seek 3 Project Managers for large scale, complex data processing systems design, development and implementation efforts with project budgets in excess of $500,000. These positions can provide rapid advancement to partnership in our international management consulting organization.

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Assume overall technical management responsibility for the design, development and implementation of a large scale utility billing and accounting system. Hospital business systems development is also desirable.

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PROGRAMMER/ ANALYST

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- advertising effectiveness system
- sales activity management system
- product planning/forecasting system
- order entry system
- sales reporting system.

Experience/background

The successful candidate must have 5 - 7 years in information systems function including

- 3 - 5 years project management experience
- successfully implemented at least two major marketing/sales systems
- 2 - 3 years experience with multinational operations
- 1 - 3 years experience with distributed systems based on mini-computer technology.

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Experience/background

The successful candidate must have experience with

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Duties

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- develop specifications for systems in marketing, field service, and general administration
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If you need further details call Jan Cederlund - Tel. No : 766.51.78 & 924.21.33.

Interested ? Send your CV and also indicate what position you are interested in, salary level and contact telephone number to :
Jan CEDERLUND, EUROPEAN EMPLOYMENT MANAGER, DATA GENERAL EUROPE, 61, rue de Courcelles 75008 PARIS (France).

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We are an established Direct Mail Company in Northern Virginia offering an excellent management opportunity. Responsibility includes managements of our data processing department, reporting to the Vice-President, Operations.

The successful candidate will have a combination of seven or more years operational management and data processing experience in systems, operations (including scheduling, planning and design) and programming in a job shop environment. Direct experience in managing a multiple 360/370 computer installation required, with language capability in JCL, BAL, etc. necessary. This generalist should possess academic background in business and computer science.

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Minimum qualifications: extensive programming experience (PL/1 preferred), knowledge of basic statistics, experience using computer-based statistical packages, supervisory skills, bachelor's degree.

Salary negotiable, based upon training and experience, send salary requirements. Date of appointment: 1 August 1978. Date of application: 28 June 1978. Submit application materials to:

William E. Cashin, Chairperson, Search and Selection Comm., Center for Faculty Evaluation and Development in Higher Education, Kansas State University, 1927 Anderson Avenue, Manhattan, KS 66502.

Interested applicants are urged to telephone (800) 255-2757 or (913) 532-5970 for further information.

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Develop diagnostic programs for NCR systems, involving logical and physical I/O for overlay drivers. Need 2+ years in assembly language diagnostic system development, working with mag media formatting and drivers. BS in EE or Computer Science with emphasis on digital systems and machine level programming.

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Please send resume, indicating both position of interest and salary history, to: **Mr. Jerry Long, Manager, Professional Recruitment, or Rick Veldhouse, Professional Recruiter, NCR Corporation, Engineering and Manufacturing, Wichita, Kansas; (316) 667-6192.**

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Computer Systems

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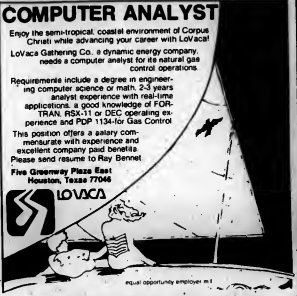

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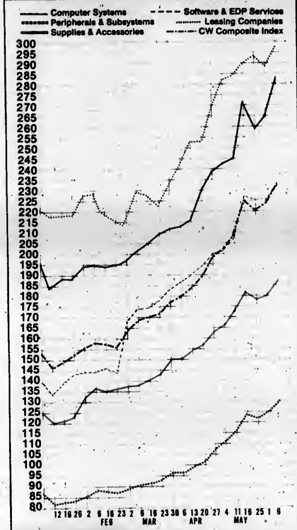

Earnings Reports

ALPEX COMPUTER
Three Months Ended March 31

	1976	1977
Loss	$121,409	$24,801

COMTEN
Three Months Ended March 31

	1978	1977
Shr Ernd	$.86	$.16
Revenue	11,807,000	7,175,000
Tax Cred	680,000	118,000
Earnings	2,287,000	407,000

DATASCOPE
Three Months Ended March 31

	1976	1977
Shr Ernd	$.26	$.34
Revenue	3,607,000	3,152,000
Earnings	294,000	365,000
9 Mo Shr	.74	.95
Revenue	9,801,000	8,620,000
Earnings	834,000	1,082,000

DATA SYSTEMS ANALYSTS
Year Ended Dec 21

	1977	1976
Shr Ernd	$.65	$.34
Revenue	4,657,303	3,533,958
Earnings	433,280	258,884

DIGI-LOG SYSTEMS
Three Months Ended March 31

	1978	1977
Shr Ernd	$.14	$.33
Revenue	1,259,465	1,104,994
Tax Cred	12,306	91,230
Earnings	101,760	218,189
6 Mo Shr	.47	.37
Revenue	2,589,048	1,752,587
Tax Cred	118,944	105,896
Earnings	352,048	248,326

NATIONAL COMPUTER SYSTEMS
Three Months Ended April 30

	1978	1977
Shr Ernd	$.30	a$.23
Revenue	6,434,500	4,018,400
Earnings	495,700	381,600

a-Adjusted to reflect 50% stock dividend in December 1977.

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TRADE QUOTES

Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, JUNE 7, 1978

All statistics compiled, computed and formatted by
TRADE QUOTES, INC.
Cambridge, Mass. 02139

COMPUTER SYSTEMS

EXCH		PRICE 1977-78 RANGE (1)	CLOSE JUNE 7 1978	WEEK NET CHNGE	WEEK PCT CHNGE
A	AMDAHL CORP	22- 36	36 1/4	+3 3/8	+10.2
N	BURROUGHS CORP	55- 81	76 1/8	+4 1/8	+5.7
O	COMPUTER AUTOMATION	18- 36	36 1/4	+2 1/2	+7.4
N	CONTROL DATA CORP	20- 35	35 3/8	+2 3/4	+8.4
O	CRAY RESEARCH INC	15- 46	38 1/2	-2	-4.9
N	DATA GENERAL CORP	35- 61	59 3/4	+4 3/8	+7.9
N	DATAPOINT CORP	18- 61	60 7/8	+5	+8.9
N	DIGITAL EQUIPMENT	37- 53	51 5/8	+4	+8.3
N	ELECTRONIC ASSOC.	2- 8	8 3/8	+ 1/2	+6.3
A	ELECTRONIC ENGINEER.	8- 18	17	+1 1/2	+9.6
O	FOUR-PHASE SYSTEMS	13- 32	31 5/8	+ 3/8	+1.1
N	FOXBORO	28- 54	38 3/4	+2 1/2	+6.8
O	GENERAL AUTOMATION	6- 17	17 1/8	+3 7/8	+29.2
O	GRI COMPUTER CORP	1- 1	1 3/8	+ 1/8	+10.0
N	HEWLETT-PACKARD CO	52- 87	83 7/8	+6 1/8	+7.8
N	HONEYWELL INC	43- 59	58 5/8	+1 5/8	+2.8
N	IBM	236-286	265 1/4	+7	+2.7
O	MANAGEMENT ASSIST	5- 18	17 3/8	+1 1/8	+6.9
O	MICRODATA CORP	7- 18	16 1/8	+ 1/4	+1.5
O	MINI-COMPUTER SYST	5- 12	7	- 1/4	-3.4
O	MODULAR COMPUTER SYS	5- 15	14 3/8	+ 3/8	+2.6
N	NCR	32- 57	57 1/8	+2 7/8	+5.2
O	PRIME COMPUTER INC	12- 25	23 1/2	+1 3/8	+6.2
N	PERKIN-ELMER	17- 25	25 1/4	+2 3/8	+10.3
N	RAYTHEON CO	16- 50	49 7/8	+4 1/8	+9.0
N	SPERRY RAND	30- 45	43 5/8	+1 7/8	+4.4
O	SYCOR, INC	8- 24	24	0	0.0
P	SYSTEMS ENG. LABS	5- 19	18 7/8	+1 1/8	+6.3
A	WANG LABS.	10- 24	23 1/4	+2 1/4	+10.7

LEASING COMPANIES

EXCH		PRICE 1977-78 RANGE (1)	CLOSE JUNE 7 1978	WEEK NET CHNGE	WEEK PCT CHNGE
O	ALANTHUS CORP	3- 6	5 5/8	- 1/4	-4.2
O	BOOTHE COURIER CORP	8- 18	16 7/8	+ 1/2	+3.0
O	COMDISCO INC	9- 20	19 1/2	+3 3/4	+23.8
P	COMMERCE GROUP CORP	1- 3	5/8	0	0.0
P	COMPUTER INVSTRS GRP	1- 2	1	+ 1/8	+14.2
M	DATRONIC RENTAL	0- 2	1 5/8	0	0.0
A	DCL INC	1- 4	3 5/8	- 3/8	-9.3
N	DPF INC	6- 13	12 5/8	+ 5/8	+5.2
N	ITEL	13- 27	25 5/8	+ 7/8	+3.5
N	LEASCO CORP	19- 35	33 5/8	+1 1/8	+3.4
O	LEASPAC CORP	1- 2	1 3/4	- 1/8	-6.6
P	PIONEER TEX CORP	5- 11	6 7/8	0	0.0
N	U.S. LEASING	10- 16	15 1/4	+ 3/8	+2.5

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
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EXCH		PRICE 1977-78 RANGE (1)	CLOSE JUNE 7 1978	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	0- 2	1 1/4	0	0.0
O	ANACOMP INC	7- 15	14	- 3/8	-2.6
A	APPLIED DATA RES.	5- 14	13 1/2	+ 7/8	+6.9
N	AUTOMATIC DATA PROC	23- 33	33 1/8	+1 5/8	+5.1
O	COLEMAN AMERICAN COS	1- 2	1 1/2	0	0.0
O	COMPU-SERV NETWORK	7- 15	9 1/2	- 1/2	-5.0
O	COMP ELECTION SYSTMS	8- 10	9	0	0.0
O	COMPUTER HORIZONS	1- 2	3 3/4	0	0.0
O	COMPUTER NETWORK	6- 11	10 3/4	+ 1/2	+4.8
N	COMPUTER SCIENCES	7- 12	12	+ 3/8	+3.2
O	COMPUTER TASK GROUP	1- 4	3	-1 1/2	-33.3
O	COMPUTER USAGE	1- 4	3 1/4	+ 1/8	+4.0
O	COMSHARE	5- 15	15 1/4	+2	+15.0
O	DATA DIMENSIONS INC	3- 6	5 5/8	+ 3/4	+15.3
O	DATATAB	1- 2	1	0	0.0
N	ELECTRONIC DATA SYS.	14- 23	20 3/4	0	0.0
O	INSYTE CORP	2- 3	1	- 1/8	-11.1
O	IPS COMPUTER MARKET.	1- 2	2 1/4	0	0.0
O	KEANE ASSOCIATES	3- 4	5 7/8	+2 1/8	+56.6
O	KEYDATA CORP	1- 3	1 7/8	+ 1/8	+7.1
A	LOGICON	7- 17	11 3/4	- 1/2	-4.0
A	MANAGEMENT DATA	1- 2	1 1/8	- 1/8	-10.0
A	NATIONAL CSS INC	10- 27	27 1/4	+2 7/8	+11.7
O	NATIONAL DATA CORP	4- 12	11 1/2	+ 1/2	+4.5
A	ON LINE SYSTEMS INC	16- 26	25	+1 1/8	+4.7
N	PLANNING RESEARCH	3- 7	6 3/4	0	0.0
O	PROGRAMMING & SYS	1- 1	3/4	- 1/8	-14.2
O	RAPIDATA INC	2- 6	5 1/2	+ 1/2	+10.0
O	REYNOLDS & REYNOLDS	17- 27	26 1/2	+2 1/4	+9.2
O	SCIENTIFIC COMPUTERS	1- 6	5 1/8	- 1/8	-2.3
O	TYMSHARE INC	14- 27	27 3/8	+2 5/8	+10.6
A	UPS SYSTEMS	4- 7	6 1/8	- 1/8	-2.0
N	WYLY CORP	1- 5	4 3/4	- 1/8	-2.5

PERIPHERALS & SUBSYSTEMS

EXCH		PRICE 1977-78 RANGE (1)	CLOSE JUNE 7 1978	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADDRESSOGRAPH-MULT	10- 25	24 1/4	+1 1/4	+5.4
O	ADVANCED MEMORY SYS	7- 14	13 1/8	- 1/2	-3.6
N	AMPEX CORP	8- 17	16 3/4	- 3/8	-2.1
O	ANDERSON JACOBSON	3- 9	8 1/2	+1	+13.3
N	APPLIED DIG DATA SYS	10- 20	16 3/8	- 1/8	-0.7
O	BEEHIVE INT'L	5- 12	6 1/8	+ 1/4	+4.2
P	BOLT,BERANEK & NEW	6- 10	9	+ 1/2	+5.8
N	BUNKER-RAMO	8- 18	17 7/8	+ 7/8	+5.1
P	CALCOMP	3- 9	8 1/2	- 1/8	-1.4
O	CAMBRIDGE MEMORIES	1- 8	7 5/8	+1 3/8	+22.0
N	CENTRONICS DATA COMP	16- 30	26 5/8	+ 3/8	+1.4
O	COGNITRONICS	1- 3	2 1/8	+ 1/8	+6.2
O	COMPUTER COMMUN.	5- 10	9	+ 1/2	+5.8
O	COMPUTER CONSOLES	4- 8	7 3/4	- 1/4	-3.1
A	COMPUTER EQUIPMENT	2- 6	5 1/8	- 1/8	-2.3
O	COMPUTER TRANSCEIVER	1- 1	1 3/8	0	0.0
O	COMTEN	9- 28	27 1/2	+4 3/4	+20.8
N	CONRAC CORP	19- 28	23 3/8	+ 1/8	+0.5
O	DATA ACCESS SYSTEMS	4- 5	4 1/2	+ 1/4	+5.8
O	DATA 100	6- 17	15 5/8	- 1/2	-3.1
P	DATA PRODUCTS CORP	9- 21	20 3/4	+2 1/4	+12.1
O	DATA TECHNOLOGY	3- 4	4	0	0.0
O	DATUM INC	1- 4	4	- 1/4	-5.8
O	DECISION DATA COMPUT	2- 3	2 7/8	0	0.0
O	DELTA DATA SYSTEMS	1- 1	1/2	0	0.0
A	DOCUMATION INC	6- 21	19 1/4	-1 1/8	-5.5
O	DATARAM CORP	2- 24	21 1/4	0	0.0
N	ELECTRONIC M & M	4- 7	7	+ 1/8	+1.8
O	FABRI-TEK	1- 2	1 3/8	0	0.0
O	GENERAL COMPUTER SYS	0- 2	1 3/8	0	0.0
N	HAZELTINE CORP	8- 15	14 1/4	- 1/4	-1.7
N	HARRIS CORP	28- 61	59 3/4	+6	+11.1
O	INFOREX INC	4- 10	9 5/8	+ 1/2	+5.4
O	INFORMATION INTL INC	8- 14	8 3/4	- 1/4	-2.7
O	INTEL CORP	38- 61	61	+6	+10.9
A	LUNDY ELECTRONICS	3- 6	3	0	0.0
O	MSI DATA CORP	6- 19	17 7/8	+ 5/8	+3.6
N	MEMOREX	23- 49	47 1/4	- 1/4	-0.5
N	MOHAWK DATA SCI	5- 12	11 1/4	+ 1/8	+1.1
O	PENRIL CORP	2- 9	9 7/8	+ 5/8	+6.7
N	PERTEC CORP	7- 14	11 5/8	-1 3/8	-10.5
P	POTTER INSTRUMENT	2- 2	1 3/4	0	0.0
O	PRECISION INST.	2- 2	2	0	0.0
O	QUANTOR CORP	3- 5	3	0	0.0
O	RECOGNITION EQUIP	6- 10	9 1/8	+ 5/8	+7.3
O	SCAN DATA	1- 4	3 1/4	- 1/8	-5.4
N	STORAGE TECHNOLOGY	10- 38	38 1/2	+ 3/4	+1.9
O	T BAR INC	7- 19	16	+1	+6.6
O	TALLY CORP.	4- 9	7 1/2	- 1/4	-3.2
P	TEC INC	6- 10	7 3/8	+ 1/8	+1.7
N	TEKTRONIX INC	29- 45	44 5/8	+3 7/8	+9.5
N	TELEX	2- 7	5 7/8	- 3/4	-11.3
O	TESDATA SYSTEMS CP	13- 20	19 1/2	+2 1/4	+13.0
O	WILTEK INC	1- 1	1 1/8	+ 1/2	+80.0

SUPPLIES & ACCESSORIES

EXCH		PRICE 1977-78 RANGE (1)	CLOSE JUNE 7 1978	WEEK NET CHNGE	WEEK PCT CHNGE
A	AMERICAN BUS PRODS	6- 8	8 3/8	+ 1/8	+1.5
O	BALTIMORE BUS FORMS	1- 5	4 1/2	+ 3/4	+20.0
A	BARRY WRIGHT	10- 28	26 1/8	-1 3/8	-5.0
O	CYBERMATICS INC	1- 1	1 1/8	0	0.0
O	DUPLEX PRODUCTS INC	14- 25	23 3/4	- 1/2	-2.0
N	ENNIS BUS. FORMS	6- 16	16 3/8	+1 3/8	+9.1
N	3M COMPANY	43- 57	56 3/4	+3 3/8	+6.3
O	MOORE CORP LTD	24- 37	33 1/2	+1 1/2	+4.6
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O	STANDARD REGISTER	18- 26	24 1/2	- 1/4	-1.0
A	TAB PRODUCTS CO	5- 13	11	+ 1/4	+2.3
N	UARCO	19- 27	24 3/8	+ 3/4	+3.1
A	WABASH MAGNETICS	10- 15	14 1/4	+1 1/4	+9.6
N	WALLACE BUS FORMS	17- 25	24 5/8	+1	+4.2

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Fran Tarkenton's product isn't coffee makers. It's the Personnel Management Reporting System from MSA.

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